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1913

# HENDERSON'S GARDEN GUIDE



*THE GARDEN BOUNTIFUL*

PETER HENDERSON & CO.  
35 & 37 Cortlandt Street  
NEW YORK

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HENDERSON'S GARDEN GUIDE AND RECORD.

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# "Everything for the Garden"

LAWN AND FARM  
AND THE BEST OF EVERYTHING

SUPPLIED BY

PETER HENDERSON & CO.

35 and 37 Cortlandt Street

NEW YORK

FOUNDED 1847

ESTABLISHED 67 YEARS



VEGETABLE SEEDS      FLOWER SEEDS      FARM SEEDS

GRAIN, GRASS AND CLOVER SEEDS

ORNAMENTAL FRUIT AND VEGETABLE PLANTS

FLOWER BULBS

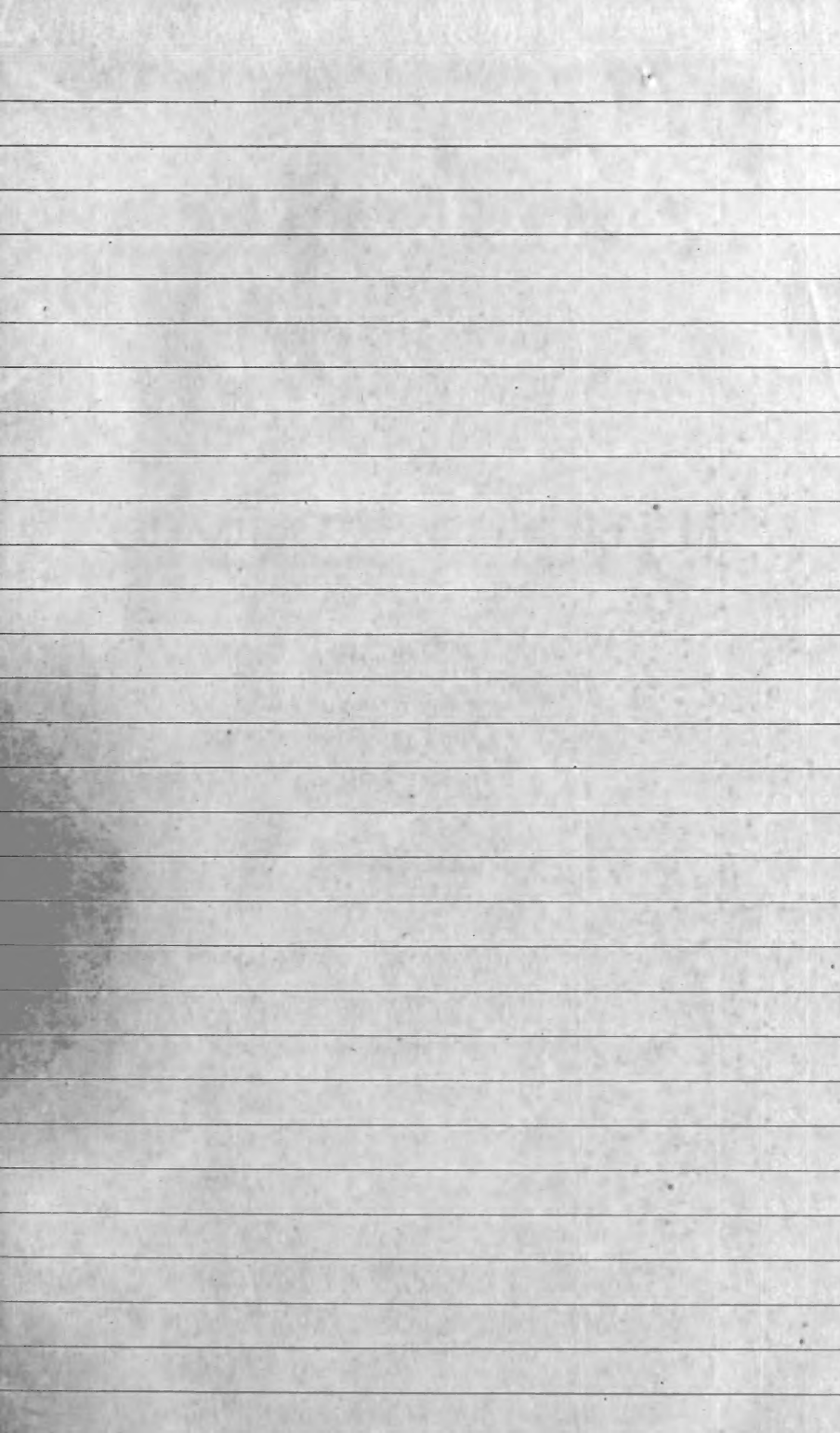
GARDEN AND FARM REQUISITES

IMPLEMENTS      TOOLS      FERTILIZERS

INSECTICIDES      FUNGICIDES      SPRAYING APPLIANCES

AGRICULTURAL AND HORTICULTURAL BOOKS, &c., &c.





DAY	DATE	TEMP'R 8 a.m.	WEATHER	JANUARY 1913 GARDEN RECORD	
W	1				
Th	2				
F	3				
Sa	4				
Su	5				
M	6				
Tu	7				
W	8				
Th	9				
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Sa	25				
Su	26				
M	27				
Tu	28				
W	29				
Th	30				
F	31				

DAY	DATE	TEMPER 8 a.m.	WEATHER	FEBRUARY 1913 GARDEN RECORD	
Sa	1				
Su	2				
M	3				
Tu	4				
W	5				
Th	6				
F	7				
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Sa	22				
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W	26				
Th	27				
F	28				

# MARCH 1913 GARDEN RECORD

DAY	DATE	THERM'R 8 a.m.	WEATHER
Sa	1		
Su	2		
M	3		
Tu	4		
W	5		
Th	6		
F	7		
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Sa	22		
Su	23		
M	24		
Tu	25		
W	26		
Th	27		
F	28		
Sa	29		
Su	30		
M	31		

# APRIL 1913 GARDEN RECORD

DAY	DATE	THERMOMETER 8 a.m.	WEATHER	
Tu	1			
W	2			
Th	3			
F	4			
Sa	5			
Su	6			
M	7			
Tu	8			
W	9			
Th	10			
F	11			
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Tu	15			
W	16			
Th	17			
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M	21			
Tu	22			
W	23			
Th	24			
F	25			
Sa	26			
Su	27			
M	28			
Tu	29			
W	30			

# MAY 1913 GARDEN RECORD

DAY	DATE	TEMPER 8 a.m.	WEATHER
Th	1		
F	2		
Sa	3		
Su	4		
M	5		
Tu	6		
W	7		
Th	8		
F	9		
Sa	10		
Su	11		
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M	26		
Tu	27		
W	28		
Th	29		
F	30		
Sa	31		

# JUNE 1913 GARDEN RECORD

DAY	DATE	TEMPER 8 a.m.	WEATHER
Su	1		
M	2		
Tu	3		
W	4		
Th	5		
F	6		
Sa	7		
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Tu	24		
W	25		
Th	26		
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Sa	28		
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# HENDERSON'S GARDEN GUIDE AND RECORD

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## INTRODUCTION

This is an age of the high cost of living. The fundamental cause being the increase of twenty per cent. in our population every decade, which far outstrips the increase in acres tilled. Therefore it behooves all who control any ground capable of being gardened to develop their resources, grow their own vegetables, small fruits, etc., supply their tables during summer with fresher and better products than are usually sold in markets and stores, and can or otherwise preserve some for winter use. There is no more healthful, interesting and profitable diversion than this when modern gardening methods are practiced and then those who garden are at least partially independent when "things are too high-priced." ¶ To aid the impetus being given to the present "back to the land" movement, we have issued this "pocket edition Garden Guide" for inexperienced gardeners.

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In this booklet of convenient pocket form—so that it may be taken right out in the garden—we have endeavored to give as concisely as possible correct cultural directions for the leading vegetables and flowers from seeds and answer in simple language many of the hundred and one questions that sometimes perplex the amateur gardener. The various topics while not exhaustive are treated in an up-to-date manner and may be quickly found by referring to the index, on pages 2 and 3.

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## ANOTHER FEATURE of HENDERSON'S GARDEN GUIDE and RECORD

Is the blank pages for making notes, such as the kind of vegetable, fruit or flower, date of sowing or planting, first products, continuity, quality, etc. In fact many little records should be kept in it to refresh one's mind regarding another season's gardening operations.

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## 👉 WE INVITE OUR PATRONS TO AID US IN EDITING 👉 NEXT YEAR'S GARDEN GUIDE

Any unusual and successful experiences in growing vegetables and flowers, questions and answers on gardening topics that should be covered, or any suggestions for the betterment and usefulness of the Garden Guide will be gratefully considered.

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PETER HENDERSON & CO.  
35 & 37 CORTLANDT STREET NEW YORK

## INDEX.

	PAGE.		PAGE.
Artichokes, Globe or French	22	Corn Salad Culture	14
Asparagus Culture	12	"    "    Latest Date for Succession	19
"    How to Grow "Prizetaker"	18	"    "    Protecting in Fall	20
"    How to Lengthen the Season	23	Cress Culture	14
"    Insects	59	Cucumber Culture	14
"    To Can	63	"    How to Grow "Prizetaker"	18
Asters, How to Grow	32	"    Latest Date to Sow for Pickles	19
"    Insects and Diseases	63	"    Insects and Diseases	59
Bean Culture	12	Cultivation	9
"    How to Grow "Prizetaker"	18	Currant Culture	53
"    Latest Successional, Date to Sow	19	"    Insects and Diseases	59
"    Lima, Plant Eyes down	23	Dahlia Culture	42 and 43
"    Diseases	59	"    Insects and Diseases	43 " 59
"    To Can	63	"    Storing the Roots, Etc.	43
Beet Culture	12	Dewberry Culture	53
"    Swiss Chard	17	Drainage	9
"    How to Grow "Prizetaker"	18	Drying Vegetables for Winter Use	64
"    Latest Successional, Date to Sow	19	Egg Plant Culture	14
"    Storing for Winter Use	20	"    "    How to Grow "Prizetaker"	18
"    Diseases	59	"    "    Insects and Diseases	59
"    To Can	63	Endive Culture	14
Blackberry Culture	53	"    Latest Date for Succession	19
"    Insects and Diseases	59	"    Insects	59
Borecole. (See Kale)	14 and 20	Fertilizing Ingredients Consumed from one Acre	62
Brussels Sprouts Culture	12	Fertilizers Required for Small Areas	23
"    "    Storing for Winter Use	20	Fetticus. (See Corn Salad)	14, 19 and 20
Bulbs, Culture of Hardy Spring	38	Flower Seeds, Alphabetical List	29
"    "    "    Tender Summer	39	"    "    Cultures	30 and 31
"    "    in House in Winter	39	"    "    Aid in Selecting	36 " 37
"    "    in Cold Pit	25	"    "    Seedlings in Coldframe	4
Cabbage in Coldframe for Winter Use	4	"    "    Starting in Hotbed	5
"    Seedlings—Wintering	4	Frost Protection—"Smudging"	61
"    Culture	13	Garden Ground Preparation, Etc.	9
"    How to Grow "Prizetaker"	18	"    Friends that Should not be Destroyed	61
"    Storing for Winter Use	20	Gladiolus, Garden Culture	44
"    Insects and Diseases	59	Gooseberry Culture	53
Canning Vegetables for Winter Use	63	"    Insects and Diseases	59
Cauliflower in Coldframe for Winter Use	4	Gumbo. (See Okra)	15
"    Seedlings—Wintering	4	Grape Culture	52
"    Culture	13	"    Insects and Diseases	59
"    How to Grow "Prizetaker"	18	Herbs, To Dry	64
"    Insects and Diseases	59	Hotbed, How to Make and Manage	5
Carrot Culture	13	"    Seeds to Start in It	5
"    How to Grow "Prizetaker"	18	How to Grow "Prizetaker" Vegetables	18
"    Latest Successional, Date to Sow	19	Insect and Plant Disease Remedies	59 and 60
"    Storing for Winter Use	20	Insecticides and Fungicides	57 to 59
"    Insects	59	Kale Culture	14
Celery Culture	13	"    in Winter	20
"    Blanching with Boards	13	Kohl Rabi Culture	15
"    Storing for Fall and Winter	20	"    "    Latest Date for Succession	19
"    Insects and Diseases	59	Lawn Making and Maintaining	54 to 56
Celeriac Culture	13	"    Weeds in Grass and Walks	56
Christmas Salad	22	"    Worms and Moles	56
Chrysanthemums, How to Grow	40 and 41	Leek Culture	15
"    Insects and Diseases	41 " 59	"    Storing for Winter	20
Coldframe, How to Make and Manage	4	Lettuce in Coldframe for Winter Use	4
"    Vegetables for Winter Use	4	"    Seedlings, Wintering in Frame	4
"    Wintering Seedlings	4	"    Culture	15
"    What to Sow in it in Spring	4	"    Latest Date for Succession	19
Cold Pit and What to Winter in it	5	Corn, Sugar, Culture	14
Corn, Sugar, Culture	14	"    "    How to Grow "Prizetaker"	18
"    "    How to Grow "Prizetaker"	18	"    "    Latest Date for Succession	19
"    "    Latest Date for Succession	19	Corn, Sugar, Insects	59
"    "    To Dry for Winter	64	"    "    To Can	63
"    "    To Can	63		

INDEX.—Continued.

PAGE.	PAGE.
Lettuce Carrying through Winter in South..... 15	Raspberry Culture..... 53
“ Protecting for Fall Use..... 19	“ Insects and Diseases..... 60
“ Insects and Diseases..... 60	Rhubarb Culture..... 16
Lime, Does your Soil Need?..... 61	“ Fresh During Winter..... 23
Manure Water, How to Make..... 23	Root Crops, How to Grow “Prizetaker” 18
Melon, Musk, Culture..... 15	“ “ How to Store for Winter 19 and 20
“ “ How to Grow “Prizetaker” 18	Rose, Garden Culture..... 46
“ “ Insects and Diseases..... 60	“ Insects and Diseases..... 47 and 60
“ Water, Culture..... 15	Salad, Christmas, Witloof Chicory..... 22
Moles, How to Exterminate..... 56	Salsify Culture..... 17
Mushroom Culture..... 21	“ How to Store for Winter..... 20
“ Field Culture..... 21	Sea Kale Culture..... 17
“ To Can..... 64	Seed Sowing..... 9 and 11
Names, Popular and Common, of Flowers Plants and Shrubs..... 49 to 51	Seedlings of Vegetable Plants Illustrated 24 to 27
Number of Trees or Plants per Acre.... 23	Shrubs, When to Prune..... 48
Okra Culture..... 15	Slime on Ponds..... 61
“ To Dry for Winter..... 64	Spinach..... 17
Onion Culture..... 15	“ Latest Successional Sowing.... 19
“ How to Grow “Prizetaker”..... 18	“ Protection for Winter..... 20
“ Storing for Winter Use..... 20	Squash Culture..... 17
“ Insects and Diseases..... 60	“ How to Grow “Prizetaker”..... 18
Oyster Plant. (See Salsify)..... 17 and 20	“ How to Store for Winter..... 20
Pansies, How to Grow..... 32	“ Insects and Diseases..... 60
“ Insects and Diseases..... 60	“ To Dry for Winter..... 64
Parsley in Coldframe for Winter Use... 4	Strawberry Culture..... 52
“ in Window Boxes for Winter Use 16	“ Insects and Diseases..... 60
“ Culture..... 16	Sweet Pea Culture..... 34
“ How to Grow “Prizetaker”..... 18	“ Preparing for Exhibition.... 35
“ To Hasten Germination..... 23	“ Insects and Diseases..... 60
“ Insects..... 60	Swiss Chard Culture..... 17
“ To Dry for Winter..... 64	Tomato Culture..... 17
Parsnip Culture..... 16	“ How to Grow “Prizetaker”..... 18
“ How to Grow “Prizetaker”..... 18	“ Keeping Until Christmas..... 20
“ Storing for Winter Use..... 20	“ Insects and Diseases..... 60
“ Insects..... 60	“ To Can..... 64
Pea Culture..... 16	Transplanting..... 11
“ Latest Date to Sow for Succession.. 19	Turnip Culture..... 17
“ To Hasten Germination..... 23	“ How to Grow the “Prizetaker”.. 18
“ Insects and Diseases..... 60	“ Latest Date for Succession..... 19
“ To Dry for Winter..... 64	“ Storing for Winter Use.... 19 and 20
“ To Can..... 64	Vegetables, To Start in Coldframe.... 4
Peony Culture..... 45	“ in Coldframe for Winter Use 4
Pepper Culture..... 16	“ To Start in Hotbed..... 5
“ How to Grow “Prizetaker”..... 18	“ Seeds, Planter's Table..... 8
Plant Feeding..... 9	“ Garden Planning..... 10
Planning the Garden..... 10	“ Companion Crops..... 11
Potato, Storing for Winter..... 20	“ Culture of the Various. 12 to 17
“ How Extra Early are Produced. 23	“ How to Grow “Prizetaker”.. 18
“ Scab..... 60	“ What to Grow for Fall Use... 19
“ Insects and Diseases..... 60	“ What and How to Store for Winter..... 19 and 20
Protecting Fruits and Vegetables from Birds..... 60	“ When to Gather at their Best 20
Pruning Shrubs and Vines..... 48	“ Names in Different Languages..... 28
Pumpkin Culture..... 16	“ Canning and Drying... 63 and 64
“ How to Grow “Prizetaker”... 18	Vines: Cucumbers, Melons and Squash 18
“ Storing for Winter..... 20	Weeds in Lawns and Walks..... 56
“ Insects..... 60	When to Plant..... 6 and 7
“ To Dry for Winter..... 64	Witloof..... 22
Quantity of Plants or Trees per Acre.... 23	Worms in Lawns..... 56
“ “ “ for Filling Beds..... 48	
Radish Culture..... 16	
“ Latest Date for Succession..... 19	
“ Insects..... 60	

# Coldframes and Their Uses.

## HOW TO MAKE AND MANAGE.

THE COLDFRAME is indispensable in every well-ordered garden in freezing latitudes. With it one is able to winter over many important seedlings, vegetables and flowers, rendering them so hardy and sturdy, that they can be safely transplanted in the open ground in the spring weeks before it would be safe to put out the softer plants from spring-sown seeds, thereby ensuring extra early vegetables and flowers. Besides, with a coldframe, several kinds of the hardier vegetables may be grown for use during the winter.

**HOW TO MAKE AND MANAGE A COLDFRAME:** Coldframes are made on the surface of the ground, no excavation being required. Select a sunny situation, sheltered, if possible, from the north and west wintry winds. The south side of a wall, stable or house is an ideal location. Stakes about 3 feet long and 2 x 3 inches thick, pointed at the bottom end, are driven in the soil at the end and middle of each board, the boards being nailed to the inside of the stakes so as to form a frame—close to the ground—that will be about 18 inches high at the back and 12 inches high in front. This gives the proper slope to the sash to catch the sun.

The distance between the parallel front and back boards should be 3 inches less than the length of the sash to allow for the slope, and also to permit the sash to hang over the frame slightly, so they can be easily lifted for airing. The length of the frame will depend on how many plants are to be wintered over.

Make the soil in the frame as rich and mellow as a well-prepared garden bed, do not put the sashes on until there is danger of freezing, and then only keep them on during the night. The sash should be taken off during the day, when the weather is above the freezing point of 32 degrees, and even with several degrees of frost, particularly if the sun is shining; the sash must be raised two or three inches at one end for air during the day, otherwise the temperature will become too high in the frame, causing the plants to become tender.

When the weather is extremely cold—10 degrees above zero or colder—the sashes must be covered at night with straw mats, blankets or board shutters. These extra coverings should be taken off during the day, unless the ground in the frame was frozen before they were put on; in the latter case, if they remain on for two or three days during severe cold spells, no harm will be done. Snow should be removed also, unless the ground in the frames was frozen before it fell.

**COLDFRAME VEGETABLES FOR WINTER USE:** Early Cabbage, Cauliflower, Lettuce and Parsley are the vegetables usually grown in coldframes for winter use. These must be sown early enough to permit the plants to develop nearly their maximum size before freezing weather sets in, after which but little growth will be made. The plants will then stand still, practically being preserved in their naturalness and crisp freshness for weeks so they may be used as required. The smaller, early, compact-growing varieties are used for the above purpose, such as Miniature Marrow and Wakefield Cabbage, Snowball Cauliflower, Tenderheart, Mignonette and Golden Queen Lettuce and Emerald Parsley. Sowings of these should be made in the latitude of New York City about as follows: Cabbage and Cauliflower, early in August. Lettuce, early in September. Parsley in the spring. The seedlings to be grown on in the usual way and be transplanted to the coldframe as soon as large enough. The Cabbage, Cauliflower, 18 inches apart, Lettuce, 8 inches apart, Parsley, 6 inches apart.

**COLDFRAME WINTERED SEEDLINGS.** The seedling plants usually wintered over in coldframes are Cabbage, Cauliflower and Lettuce, which are sown for this purpose in the latitude of New York City between the 10th and 20th of September. About a month later they will be large enough to be transplanted 2 inches apart in the coldframe. The seedling flowering plants usually wintered over in coldframes are Auriculas, Bellis, Cowslips, Myosotis, Pansies and Hollyhocks.

Coldframes are not only useful for wintering over such plants as mentioned above, but they are of value in raising early Radishes, Parsley, Carrots, Beets and other hardy vegetables and flowers for setting out in the open ground in April or May, the seed of which may be sown in coldframes in the latitude of New York about the 1st of March, thinning the seedlings out so the remaining plants can fully develop, which they will do weeks before they can be obtained from open ground sowings.

COLD PITS are identical with Coldframes described on preceding page, except that an excavation of from two to four feet is made below the general level of the ground so as to admit of larger plants being placed in them. The sunken pit is a better protection than the coldframe; for, when sunk to the depth of two or three feet and covered with glass, it will resist a much heavier frost than the frames on the surface. Pits are, therefore, to be preferred for protecting all half-hardy bulbs grown in pots, which can be brought out and flowered in the house in the winter, or be carried along until spring and then be planted out in the open border. Cold pits are also excellent, on account of their coolness, for retarding reserves of such bulbs as Hyacinths, Tulips, Narcissus, Freesias, etc., and plants of Carnations, Roses, Azaleas, Spiræas, Camellias, etc., which may be removed to the conservatory or window-garden at pleasure, and where on account of more heat and light they will soon be forced into flower, thus keeping up a fresh supply of bloom throughout the winter and spring months. Care must be taken that both coldframes and cold pits are well drained either from the nature of the soil or otherwise, as water standing in them would be destructive to the plants, whether planted in the soil or grown in pots.

## The Hotbed and Its Uses.

### HOW TO MAKE AND MANAGE.

For those who have no greenhouse, there is no better way to "start" seeds and grow seedlings of tender plants for setting out in spring than in a hotbed, which is made exactly as the coldframe described on preceding page, excepting that for a hotbed the soil must be excavated about two feet in depth, the sides of the frame to be boarded to the bottom.

In this excavation the manure for heating—prepared as below—is to be packed to a depth of from eighteen to twenty-four inches, bearing in mind that the greater depth of manure gives the greater and more lasting heat. For general purposes, a hotbed made in the vicinity of New York, at the beginning of March, manure eighteen inches deep will be sufficient; in a colder section, or earlier in the winter, or for the production of such tender plants as Peppers and Egg-Plants, twenty-four and thirty inches of manure may be required; in the latter case, the excavation above mentioned must be made correspondingly deeper.

**THE PREPARATION OF THE MANURE:** Procure a sufficient quantity of fresh horse manure, and, if possible, add an equal bulk of leaves from the woods, or even tanbark or refuse hops. Mix them thoroughly and tramp down successive layers into a compact conical pile, and leave it there until fermentation has started, which should be in two or three days' time, but will be indicated by the escaping steam. Then turn the pile so the rank steam may escape, forming a similar pile, and let it remain until the second fermentation begins, which should begin in two or three days more. In very cold weather it may be necessary to cover the pile with a few inches of straw or hay, to prevent chilling before fermentation sets in, or, better yet, make the pile in a shed. As soon as the manure is ready, place it in the pit and tramp it down in layers to the required depth, then put on the sashes and leave it until the heat generates, which will usually take twenty-four hours; then plunge a thermometer in the manure, and if it is all right it will indicate 100 degrees or more. This is still too hot, but in two or three days more it will subside. As soon as the plunged thermometer indicates ninety degrees or less, then put on about six inches of soil, which should be rich, light and mellow. The beds should now be left with the sashes on for a few days, until the soil has become warmed through and the weed seeds have germinated; then remove the sashes, rake to kill the weeds and level the surface, and all is ready for the sowing of your seeds. After this, daily attention must be given. When mild, air must be given by raising the sashes slightly, especially if the sun is shining, otherwise your plants may be burned up. Toward sunset the sashes must be closed down before cold air begins to chill the tender plants. As a general rule, it will be safe on all pleasant days in March and April to have the sashes, or at least every other one, raised from one to three inches at the top end from 9 A.M. to 4 P.M. During cold nights the sashes must be covered with mats, shutters or blankets, which must be removed the following morning.

Careful attention must be given to watering, which should be increased as the season advances—always use tepid water, put on gently with a fine rose watering pot. It is never safe to let the soil get dry.

The seeds usually sown in hotbeds for setting out in the garden, as soon as weather and soil permit are: Early Cabbage and Cauliflower, Egg-Plant, Endive, Kohl-Rabi, Leek, Lettuce, Onion, Pepper, Tomato, and any flower seeds which it is desired to have in bloom extra early, particularly Asters, Balsams, Cannas, Carnations, Cockscorn, Cosmos, Dahlia, Dianthus, Geranium, Heliotrope, Larkspur, Marigold, Moonflower, Nasturtium, Pansy, Phlox, Ricinus, Salvia Stocks, Verbena, Zinnias, etc.

## HOW EARLY MAY I PLANT?

There is probably no gardening question so frequently asked as "How Early May I Plant?" and no question about which it is more difficult to give advice. As the subject is of so much interest to many, we quote a sample letter received by us from a Western customer, and our reply:

"I greatly appreciate the Garden Guide and Record you sent me with my recent purchase, and note that you will appreciate suggestions for improving it.

I would suggest that you include a table of latitudes which approximately designate the time of beginning gardening operations in spring, giving the cities nearest those latitudes as for instance at 40 degrees, the cities of Philadelphia, Columbus, O., Quincy, Ill., and Denver, Colo., would be nearest this latitude.

The others could be shown in the same way, going across the country."

## PETER HENDERSON &amp; CO.'S REPLY

"We very much appreciate your suggestion regarding a planting table arranged in latitudes to sow certain seeds and set out certain plants. Your latitude theory while theoretically appealing we do not think would work out, for altitude is such an important factor. As a rule the higher the altitude the cooler and more backward the season, and yet there are exceptions. Take your illustration for an example: the cities near the 40th degree latitude extending from Philadelphia to Denver. The former is probably not over 50 feet above sea level and, therefore, should have a warmer and earlier spring than Denver, which is 5,200 feet above sea level, yet yesterday's highest temperature in Philadelphia was only 50 degrees, while that of Denver was 70 degrees, accounted for by the fact that the prevailing winter winds at Denver are from the South; thus the temperature is greatly modified by the winds coming from the dry, warm regions of Arizona, etc.

In addition to thermal waves, latitude and altitude, there are other conditions to consider, viz., early, late and normal seasons; the lay of the land and the consequent effect of the sun; the soil, whether light, well underdrained and "early" or compact and clayey, which means cold and late. Even in localities in comparative proximity these local conditions may make advisable planting dates vary from one to two weeks."

Dr. Bailey, the Dean of Horticulture at Cornell, explains the matter well in his recent book entitled "The Manual of Gardening," from which we quote as follows:

"A person who is intelligent enough to make a garden, does not need an arbitrary calendar of operations. Too exact advice is misleading and unpractical. Most of the older gardening books were arranged wholly on the calendar method—giving specific directions for each month in the year. We have now accumulated sufficient facts and experience to enable us to state principles; and these principles can be applied anywhere—when supplemented by good judgment—whereas mere rules are arbitrary and generally useless for any other condition than that for which they were specifically made. Seasons and conditions vary so much in different years and different places that no hard and fast advice can be given for the performing of garden operations."

**A FEW PRINCIPLES TO CONSIDER IN GARDENING OPERATIONS: PHENOLOGY**—The observing and noting local annual progression and decline of seasons as indicated by animal and plant life, dates of migration, leafing, flowering, maturity and defoliation. If these physiological epochs of the year are carefully studied, they will enable one to determine, among other things, whether spring in your locality, is awakening fitful and variable or in a thorough and general manner, and this should be the planting guide. Only a few plants, trees or shrubs should be chosen for observation, and these should be those that do not respond quickly to a few prematurely warm spring days. Among the reliables for yearly records are apple, quince, cherry, strawberry, lilac, dogwood, grape, etc. Noting the progressive swelling of the leaf buds and expanding leaves of the grape has been the writer's infallible guide for several years as to when spring had really come. It should be realized that the soil's temperature, only a few inches from the surface, seldom varies over one-third of that of the atmosphere and the real problem with which seeds, plants, etc., have to contend is below ground.

**HOW EARLY MAY I PLANT?—Continued.**

AS A SUGGESTIVE PLANTING GUIDE we give below two lists of vegetables—one that thrives best in cool weather and the other in warm weather:

**COOL WEATHER VEGETABLES**

The seeds of which may be sown, or the plants set out very early, even before the last of the light frosts are over—temperature in the shade averaging 45°.

Asparagus, Beet, Broccoli, Brussels Sprouts, Cabbage, Carrot, Cauliflower, Celeriac, Celery, Corn Salad, Endive, Kale, Kohl-Rabi, Leek, Lettuce, Onion, Parsley, Parsnip, Peas, Potatoes, Radish, Rhubarb, Salsify, Spinach, and Turnip.

**WARM WEATHER VEGETABLES**

The seeds of which should not be sown in the open, nor the plants set out until both weather and ground are settled and warm, the temperature averaging not less than 60° in the shade.

Beans, Corn, Cucumber, Egg Plant, Melon, Okra, Pepper, Pumpkin, Squash, Sweet Potato and Tomato.



**CORN PLANTING TIME**

*(As illustrated in the 1910 Year Book of the U. S. Dept. of Agriculture.)*

The average dates of the beginning of field Corn planting in various States is indicated on the above map by the "Cross Country" lines—the earliest being in lower Florida and Texas, the latest from New Hampshire to North Dakota, covering a period of three months. This may be used as an approximate guide, as to how early the "warm weather vegetables" may be sown or planted in the open ground, "cold weather vegetables" may be sown or planted out about a month earlier, though as explained on the preceding page:

"In addition to thermal waves, latitude and altitude, there are other conditions to consider, viz., early, late and normal seasons; the lay of the land and the consequent effect of the sun; the soil, whether light, well underdrained and 'early' or compact and clayey, which means cold and late. Even in localities in comparative proximity these local conditions may make advisable planting dates vary from one to two weeks."

## REFERENCE TABLE FOR VEGETABLE SEED SOWERS.

KIND OF VEGETABLE.	DATES FOR SOWING.		BEST GERMINATING TEMPERATURE.	DAYS TO "COME UP."	READY FOR USE FROM SEED SOWN.	DISTANCE TABLE.		QUANTITY OF SEED, ETC., REQUIRED.
	UNDER GLASS	OPEN GROUND.				APART IN ROWS.	ROWS APART.	
ASPARAGUS, Seeds.....		April and May..	60°	20 to 28	3 to 4 years	1 ft.	2 ft.	2 oz. for 100 ft. row.
" Roots.....		April.....	75°	6 to 10	45 to 75 days.	3 in.	2 ft.	100 for 100 ft. row.
BEANS, Dwarf.....		May to Aug.	80°	6 to 10	65 to 100 "	3 ft.	4 ft.	1 qt. for 100 ft. row.
" Pole and Lima.....		May to June.	60°	7 to 10	60 to 75 "	4 in.	1 ft.	1 qt. for 100 hills.
BEETS.....		March.....	60°	6 to 10	85 to 120 "	2 ft.	2 1/2 ft.	2 oz. for 100 ft. row.
BORECOLE (Kale) for spring use.....		April to August	70°	6 to 10	85 to 120 "	2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
" " " for fall use.....		Aug. and Sept.	70°	6 to 10	100 to 120 "	1 1/2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
BRUSSELS SPROUTS.....		April to July..	70°	6 to 10	100 to 125 "	2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
CABBAGE, Early.....		April.....	70°	6 to 10	120 to 180 "	2 1/2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
" " " Late.....		May and June.	70°	6 to 10	120 to 180 "	2 1/2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
CARROT, Early.....		April.....	60°	10 to 15	65 to 85 "	4 in.	1 1/2 ft.	1 oz. for 100 ft. row.
" " " Late.....		May to July..	60°	10 to 15	100 to 120 "	5 in.	2 ft.	1 oz. for 100 ft. row.
CAULIFLOWER, Early.....		April.....	70°	6 to 10	100 to 115 "	1 1/2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
" " " Late.....		May and June.	70°	6 to 10	100 to 135 "	2 ft.	3 ft.	3/4 oz. for 100 ft. row.
CELERY.....		April.....	60°	12 to 20	125 to 150 "	6 in.	3 to 5 ft.	3/4 oz. for 100 ft. row.
CORN, SUGAR.....		May to July..	75°	8 to 10	60 to 100 "	4 ft.	4 ft.	1 qt. for 200 hills.
CUCUMBER.....		May to July..	80°	6 to 8	60 to 85 "	4 ft.	4 ft.	1 oz. for 60 hills.
EGG PLANT.....		March.....	80°	10 to 14	125 to 160 "	2 1/2 ft.	2 1/2 ft.	3/4 oz. for 100 ft. row.
ENDIVE.....		February.....	60°	6 to 10	75 to 100 "	1 ft.	1 ft.	1 oz. for 100 ft. row.
KOHL RABI.....		April to July..	70°	6 to 8	65 to 85 "	1 ft.	2 ft.	3/4 oz. for 100 ft. row.
LEEK.....		April and May.	60°	6 to 10	120 to 160 "	6 in.	1 1/2 ft.	1 oz. for 100 ft. row.
LETTUCE.....		February.....	60°	6 to 10	75 to 100 "	1 ft.	1 ft.	3/4 oz. for 100 ft. row.
MELON, MUSK.....		April to August	80°	6 to 10	90 to 120 "	4 ft.	4 ft.	1 oz. for 60 hills.
" " " WATER.....		May to June..	80°	8 to 12	100 to 125 "	8 ft.	8 ft.	1 oz. for 30 hills.
ONION, Seed.....		February.....	60°	6 to 10	120 to 150 "	3 in.	1 ft.	1 oz. for 100 ft. row.
" " " Sets.....		April and May.	60°	18 to 24	90 to 100 "	3 in.	1 ft.	3 pts. for 100 ft. row.
PARSNIP.....		April.....	60°	12 to 18	100 to 150 "	4 in.	1 ft.	3/4 oz. for 100 ft. row.
PEAS, Wrinkled.....		April to July..	70°	5 to 10	50 to 75 "	2 in.	2 to 4 ft.	1/2 oz. for 100 ft. row.
" " " Smooth.....		April to August	65°	5 to 10	50 to 65 "	2 in.	2 to 4 ft.	1 qt. for 100 ft. row.
PEPPER.....		March.....	80°	10 to 14	135 to 160 "	2 in.	2 1/2 ft.	1 qt. for 100 ft. row.
POTATOES.....		April to August	70°	15 to 25	75 to 100 "	10 in.	2 1/2 ft.	1/2 oz. for 100 ft. row.
PUMPKINS.....		April to June..	80°	6 to 10	100 to 125 "	8 ft.	8 ft.	1 peck to 100 ft. row.
RADISH.....		May to June..	60°	4 to 6	25 to 50 "	2 to 4 in.	1 to 1 1/2 ft.	1 oz. for 30 hills.
SALSIFY.....		April to Sept..	60°	8 to 12	125 to 160 "	6 in.	1 1/2 ft.	1/2 oz. for 100 ft. row.
SPINACH.....		April and May.	60°	6 to 12	60 to 75 "	4 in.	1 to 1 1/2 ft.	1 oz. for 100 ft. row.
SQUASH, Summer.....		April to Sept..	80°	6 to 10	60 to 75 "	4 ft.	4 ft.	1 oz. for 50 hills.
" " " Winter.....		May to June..	80°	6 to 10	100 to 125 "	8 ft.	8 ft.	1 oz. for 50 hills.
TOMATO.....		June.....	80°	6 to 10	125 to 150 "	3 ft.	3 ft.	3/4 oz. for 100 hills.
TURNIP.....		April to Sept..	70°	4 to 7	60 to 75 "	6 in.	1 to 1 1/2 ft.	3/4 oz. for 100 ft. row.



# Garden Ground Preparation.

## DRAINING, FERTILIZING, CULTIVATING, ETC.

**LOCATION:** Choose, if possible, a level location, or if there be a slope, it should be toward the south. A wind break—hedge, board fence or wall—on the north and north-west, facilitates earliness of crops.

**SOIL:** The soil for at least a foot in depth should be prepared so that it will be rich, mellow and friable. This is accomplished by adding humus, which increases the moisture-holding, food-dissolving capacity of soil. Leaf-mold and rotted stable manure form ideal humus, but where the former is not available, a crop of crimson clover sown the summer or fall before and turned under with manure in the spring, answers equally well.

**UNDER-DRAINAGE:** This differs from surface drainage and is much better than the latter, because it permits water to percolate through the soil, which absorbs the needed quantity of moisture to hold the plant foods in solution and in assimilable condition for the feeding roots, the surplus water being stored or discharged below. If the subsoil be gravelly or sandy—nature's drain—no further attention need be paid to this question, but if the subsoil is stiff clay, it should be drained either by placing continuous lines of drain tiles or  $\Delta$ -shaped board drains 3 feet below the surface and not farther than 18 feet apart, all sloping slightly to an outlet. Where this is impracticable, the next best way to treat clay subsoil is to break it up at least 6 inches in depth below the surface soil, care being taken to bring as little subsoil as possible up into the top soil. This is best accomplished with a "subsoil plow," but small gardens may be "trenched." This is done by removing a strip of top soil, digging the subsoil below, recovering it with the top soil from the next strip and so on.

**PLANT-FEEDING:** To grow vegetables to perfection, a liberal quantity of plant food must be incorporated with the soil. Both stable manure and commercial fertilizer should be used, the manure to improve the mechanical condition of the soil, and the fertilizer to supply any lacking essential in potash, nitrogen or phosphoric acid. On a quarter-acre garden 10 to 12 cords of manure is not too much to plow or dig in with 100 to 200 pounds of a well-balanced, high-grade commercial fertilizer, harrowed or raked in. Rowed crops may be further stimulated during growth by two or three supplementary side dressings of fertilizer, applied at the rate of 100 to 200 pounds per acre at each application.

It is advisable to remember the functions of various plant-feeding ingredients as a guide in their use for various crop requirements. **NITROGEN** is conducive to early, rapid and succulent growth of plant. **POTASH** hardens plant growth and throws the vigor into fruit or flower. **PHOSPHORIC ACID** aids in nutrition, influences maturity and color. **LIME** releases inert plant foods, rendering them available for feeding roots.

**CULTIVATION:** Garden crops require frequent cultivation, especially in dry weather, the object being not only to destroy weeds, but what is of more importance to conserve the soil's moisture by keeping the surface crust broken and pulverized, thus forming an "earth mulch" which checks evaporation. If the garden is planted in straight rows and on the level—that is, no raised beds—a handpower wheel-hoe may be utilized in cultivation, thus reducing the work to a minimum of speed and labor.

**FIRM THE SOIL** over seeds as soon as sown and about plants when set out providing the soil is mellow and dry, not when damp and sticky. This firming of the soil is very important, for it brings soil particles in contact with seeds and roots, prevents them from drying out, and facilitates quick growth. The best way to firm the soil in gardens is with the feet; tread every inch of the row, after which the surface soil may be leveled and "earth mulch" formed with a short-toothed rake. In larger operations, as in market gardens, truck farms and with field crops, the same results are obtained with a roller and smoothing harrow.

When plants are set out, whether vegetable, flower, shrub or tree, firm the soil over their roots by thorough treading, without which they are liable to wobble with every wind, permitting too much air to penetrate and dry the loose soil, wither the roots and cause the subject to languish.

# Planning the Vegetable Garden

It is impossible to plan specific gardens suited to all locations and requirements but a few of the principles of correct garden practice may prove suggestive to those planning individual gardens. (The subjects of location, soil, drainage, feeding, cultivating, etc., have been covered on the preceding page.)

**ARRANGEMENT OF THE VEGETABLE GARDEN.** The old style method of raised plots or beds, often bordered with grass, parsley or some dwarf edging plant makes a pretty garden but requires more time and labor to plant, cultivate and keep in order than a garden planted on the level and thereby make the most of the ground and get maximum results with a minimum of labor. The rows if practicable should run nearly north and south thus getting the full benefit of the forenoon sun on the east side of the rows and the afternoon sun on the opposite side and for the same reason tall growing plants: corn, peas, pole beans, tomatoes, etc., should be planted north of the dwarf crops so development of the latter will not be retarded nor restricted by shade.

Perennial crops, those that remain in the ground year after year, such as asparagus, rhubarb, artichokes, chives, herbs, mint, seakale, fruit plants, etc., should be grown at one end or side of the garden and not be jumbled promiscuously anywhere, thus likely interfering with soil manipulation for the annual vegetables and their situations for proper rotation. Another thing to be considered is the placing of rowed crops requiring the same distances between rows in continuous succession lengthwise of the garden preferably, and as free from paths across the rows as possible so the wheel hoe and cultivator may be advantageously used before being altered for rows of a different width. It may be stated here that a good hand power wheel hoe with its accessories is now considered an almost indispensable adjunct to up to date gardening operations. With one the work can be accomplished five times faster than with a hand hoe, much better and with greater ease; with a wheel hoe the drudgery of gardening is changed to pleasant and healthful recreation.

Another advantage of planting your garden on the level is the more even distribution of water. In raised beds or ridged rows the rain or water from the hose runs off and away from the plants which perhaps may be needing moisture badly. Then on the level and with a wheel hoe the surface of ground that crusts after a rain can be promptly and quickly stirred, thus forming a soil mulch which checks evaporation and conserves the under ground moisture.

If part of the land is low and moist such crops as celery, onions and late cucumbers should be grown there, and if another portion is high, warm and dry that is the place for early vegetables that need quick, warm soil.

## Companion and Succession Vegetable Cropping

To get the greatest amount of vegetable products throughout the season from the garden area, Companion and Succession planting is the correct practice.

**COMPANION VEGETABLE CROPS** are two or more kinds of early (quick) and later maturing vegetables that work well together planted on the same piece of ground. As the quick-growing sorts are removed, the later, slower-growing vegetables develop and occupy the ground.

Our "Table for Vegetable Seed Sowers" on page 8, may be referred to as a guide to the length of time various kinds require to be ready to use. From this Companion Crops may be planned, such as radish and lettuce between cabbages and cabbage rows. The radish being ready first, gives room for the lettuce and after the lettuce is removed the cabbage will occupy the ground. Other suggestive Companion Vegetable Crops are, early beets or bush beans with melons, squash or cucumbers, or dwarf early peas, summer onions, etc., between rows of celery which will not require "earthing up" before the summer crops are removed. Radish may be sown with beets, onions, carrots, etc., the radish being ready first will give room for the slower growing succeeding crop, etc., etc.

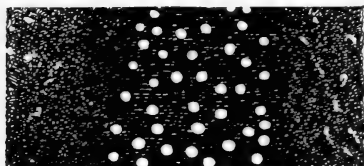
**SUCCESSION VEGETABLE CROPS** are so planned that late or fall-maturing sorts follow on the same ground early or summer-maturing vegetables. Late cabbage, cauliflower, lettuce or celery from the seed bed may take the place of early bush beans, beets, lettuce, peas, etc., or some quick-growing vegetables may be sown after the early ones have been removed—as early sweet corn, cucumbers, for pickles, turnips, bush beans, etc.

Many examples of Companion and Succession Vegetable Crops could be given but the above will suffice, as suggestions in planning to suit your own garden and requirements.

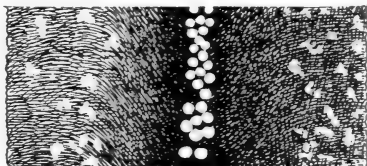
COMPANION and SUCCESSION VEGETABLE CROPPING—Continued.

**ROTATING VEGETABLE CROPS.**—Crop rotation of vegetable crops is now recognized as necessary as rotating farm crops if the balance of plant-feeding elements, stored in the soil, is to be maintained, for various types of vegetables differ greatly in their food requirements, and their extractions from the soil. Leaf crops as cabbage, lettuce, etc., large consumers of nitrogen, if grown for successive years in the same piece of ground, are likely to deplete, possibly exhaust, the supply of nitrogen and therefore should be followed by beans or peas (legumes), which add nitrogen to the soil. Our table on page 62, of "the essential fertilizing ingredients consumed by various crops" will aid in the selection of crops for rotation, but if one does not care to study the subject we advise as a rough guide, planting root or below ground crops after above ground crops and vice versa.

## The Right and Wrong Ways of Sowing Seeds in Garden Drills



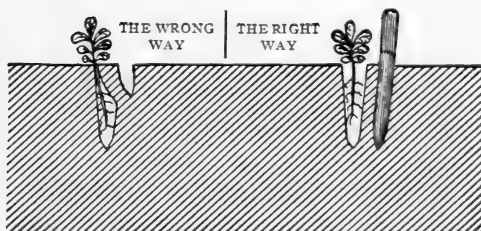
THE RIGHT WAY



THE WRONG WAY

Make the drills with a flat bottom 2 to 3 inches in width and scatter the seeds over the surface, so that every developing seedling may have at least a little feeding ground, and not be starved out in a "survival of the fittest" struggle as many are when seeds are huddled together in a V-shaped furrow. A little more time and care when sowing seeds, saves much time and labor in thinning, and in the thinning of well-scattered seedlings, those removed do not so disturb those that remain.

## Transplanting Vegetable Crops



off" before being planted out in the open garden. In the operation of transplanting, care should be used that the roots are placed down in the hole and not curled up towards the neck of the plant and also be sure that the earth is closed against the roots for their whole length, for an air space left at the bottom of the hole is likely to cause the rootlets to wither and the plant to languish (See explanatory illustration). Some vegetable plants are greatly benefited by one or more transplantings which causes a bushy growth of roots—among these are notably cabbage, cauliflower, celery, lettuce, tomatoes, etc. Some other kinds are difficult to transplant and are best transferred from the seed bed to paper pots or other receptacles so they may be grown individually and be planted in the open garden with but little disturbance of the root system—among these "hard to transplant" vegetables are beans, cucumbers, melons, squash, etc.

In cool northern climates where some vegetables are wanted early, it is the custom to start the seeds in a protected or glass covered seed bed and from here transplant the seedlings as soon as they are large enough to handle—and when they begin to crowd one another. These seedlings should be transplanted 1 to 2 inches apart in another seed bed where they can "harden

## BRIEF DIRECTIONS FOR THE SOWING AND CULTURE OF

## Garden Vegetables

## ASPARAGUS.

1 ounce for 50 feet of drill.

ASPARAGUS SEED is sown in the spring. The earlier the better after frost is out of the ground and the soil in good workable condition, not sticky. Scatter the seed an inch apart in drills 2 to 3 feet apart and cover with about 1 inch of soil. After the plants are well up thin them to stand not less than 2 inches apart. Such seedlings, if kept cultivated, free from weeds and not allowed to suffer from lack of water during summer and autumn will be fit to be planted out in permanent beds the succeeding spring and should commence bearing in 3 or 4 years.

ASPARAGUS ROOTS. A saving in time of 2 years or more is made by purchasing roots, which can be planted any time for six to eight weeks from the opening of spring. For private use, beds should be formed five feet wide, with three rows planted in each, one in the middle and one on each side, a foot from the edge; the plants in the rows should be 1 foot apart. In planting a cut is made a little slanting to the depth of six or eight inches. The plants are then laid against the side of the trench, at the distance already named, care being taken to properly spread the roots. The crown or top of the plant should be covered about three inches. In a week or so after planting the beds should be touched over lightly with a rake, which will destroy the germinating weeds. The raking had better be continued at intervals of a week or so, until the plants start to grow, when the hoe or hand-cultivator may be applied between the rows. The weeds that come up close to the plant must be pulled out by the hand. The deeper the soil and greater abundance of manure that is used the greater will be the crop, for Asparagus is a gross feeder. An application of one-half pound of salt per square yard annually in spring is very beneficial.

## BEANS, Dwarf or Bush.

1 qt. to 100 feet of drill; 1 bushel to the acre in drills.

Beans succeed best in sandy loam, enriched with well-rotted manure. Sowings may be made every two weeks from the first week in May until September to supply a succession of "snap beans" in the latitude of New York. Further south sow earlier; further north, later. Plant 2 inches deep in drills eighteen inches to two feet apart, according to the richness of the soil. The seeds should be dropped about two inches apart and the plants thinned out to stand about 4 to 6 inches apart in the row.

## BEANS, Pole or Climbing.

1 qt. to 100 hills; 10 to 16 qts. to the acre in hills.

These are planted in hills formed, according to variety, from three to four feet apart; from five to six seeds are planted in each hill, about two inches deep. The season is too short for succession crops in the North, though it is advantageous to plant succession crops in the Southern States. Rough cedar or similar poles seven to eight feet long should be used for Pole Beans, to climb on. They should be set in the ground at least eighteen inches, so as to prevent being blown over. In localities subject to severe wind and storms, the poles are slanted so two or three, the latter in triangular fashion, are tied together at their tops, thus forming a very strong structure.

POLE LIMA BEANS are grown the same as other pole beans, excepting, being more tender, must be planted about 2 weeks later.

## BEET.

1 oz. to 50 feet of drill; 5 lbs. to the acre in drills.

The best soil for Beets is rather light, thoroughly enriched the year before, with well-rotted manure. For early, sow in spring, as soon as the ground is fit to work, in drills about one foot apart and two inches deep. For main crop, sow the first week in May, and for winter use, sow in June. These dates are for the latitude of New York. South, sow earlier; north, later. When the plants have attained three or four leaves, thin out to four inches apart.

## BRUSSELS SPROUTS.

1 ounce will produce 1500 plants.

Sow outside in drills in May and transplant two feet apart in July. Cultivate same as Cabbage; thus it may be had in fine condition from October until December, and in the Southern States may be had in use from November to March.

## CABBAGE.

1 oz. will produce 1,500 plants; half-pound to transplant for an acre.

The early varieties of Cabbage in our Northern States must either be sown in hotbeds in February, or, what is still better, wintered over in coldframes; for this purpose the seed is sown from the 10th to the 20th of September. In four or five weeks from the time of sowing they will be fit to transplant into the coldframes. In planting it is very important with Cabbage or Cauliflower that the plant is set down to the first leaf, so that the stem is all under ground, for, if exposed, it may be split by the action of the frost. The plants are set out from the middle of March to the middle of April, in rows about two feet apart, and eighteen inches between the plants in rows. This earliest crop matures in June. For second early the early kinds should be sown first week in April and planted out in May. This crop matures in July and August. Late Cabbage for fall and winter use, sow from May to June. The plants are set in July, at distances of three feet between the rows and two feet between the plants. This crop matures September, October or November.

## CAULIFLOWER.

1 oz. will produce about 1,000 plants.

The soil and cultural requirements of Cauliflower and Cabbage are similar.

The seed may be sown in September and wintered over in the same manner as described for early Cabbage. Where this is not practicable, Cauliflower may be had nearly as well by sowing the seeds in the hotbed in February or March and transplanting the plants two or three inches apart in a coldframe, until such time as safe to be planted in the open ground, which, in the latitude of New York City, is from the 15th of March to the 10th of April. If properly hardened off they are seldom injured by planting out too early. For second and late crop sow at same date as given in the directions for Cabbage crop.

## CARROT.

1 oz. for 100 feet of drill; 4 lbs. for an acre.

The Carrot, like other root crops, delights in a sandy loam, richly tilled. For early crops sow in spring, as soon as the ground is in good working order; for later crops they may be sown any time until the middle of June. Sow in rows about fifteen inches apart, thinning out to three or four inches between the plants. As Carrot seed is slow to germinate, extra precautions must be taken to firm the seed in the soil, as described on page 3.

## CELERY.

1 oz for 3,000 plants; 1 lb. to transplant for 1 acre.

Sow in the open ground as soon as it is fit to work in April, and keep clear of weeds until time of transplanting in June or July. The tops should be shorn once or twice before transplanting, so as to ensure "stocky" plants. The lower half of the roots should also be cut off before transplanting.

Set the plants six inches apart in rows 3 feet apart. If the weather be dry at the time of planting care should be taken that the roots are properly "firmed." Our custom is to turn back on the row and press by the side of each plant gently with the foot. This compacts the soil, and excludes the air from the roots until new rootlets are formed, which will usually be in forty-eight hours. Nothing further is to be done for six or seven weeks, except freeing the plants of weeds until they get strong enough to crowd them down. This will bring us to about the middle of August, by which time we have usually that moist and cool atmosphere essential to the growth of Celery. Then we begin the "earthing up" necessary for the blanching and whitening of that which is wanted for use during the fall months. The first operation is that of "handling," as we term it; that is, after all the soil has been drawn up against the plant with a hoe, it is further drawn close around each plant by the hand, firm enough to keep the leaves in an upright position and prevent them from spreading. This being done, more soil is drawn against the row (either by the plow or hoe, to keep the plant in this upright position. The blanching process must, however, be finished by the spade, which is done by digging the soil from between the rows and banking it up clear to the top on each side of the row of Celery.

**Blanching Celery with Boards.** Celery for early use is often blanched with boards 10 to 12 inches in width, set on edge on either side of the row and close to the plants, the top edges inclining together and resting against the plants so the boards are only 2 to 3 inches apart, in which position they are held with wire hooks or cleats nailed across. Boarding is done when the plants are large enough to show a few leaves above the boards. The foliage then soon fills the space excluding the light so that the stalks will be blanched in from 10 to 20 days.

## CELERIAC.

Sow about April 20th in latitude of New York, covering seeds about one-half of an inch. Thin out to about one inch apart in the row, and when large enough transplant into rows two feet apart and five inches apart in the row.

## CORN, Sugar.

1 qt. for 200 hills; 8 to 10 qts. in hills for an acre.

All varieties of Sweet or Sugar Corn may be either sown in rows four and a half feet apart, and the seeds placed about eight inches apart in the rows, or planted in hills at distances of three or four feet each way, according to the variety grown or the richness of the soil in which it is planted. The taller the variety, or the richer the soil, the greater should be the distance apart. We make our first plantings in this vicinity about the middle of May and continue successive plantings every two or three weeks until the last week in July. In more southerly latitudes planting is begun a month earlier and continued a month later.

## CORN SALAD, or Feticus.

For spring crop, sow as early as practicable after frost is out of ground, in rows twelve inches apart, covering seeds about one-half of an inch, thinning the seedlings to 6 inches apart. This crop should be ready in eight weeks from sowing. For an earlier spring crop, sow in September, covering with salt hay or straw when frost sets in. A sowing should also be made in August for fall use.

## CRESS, or Pepper Grass.

A well-known pungent salad. Requires to be sown thickly in rows and covered very slightly. Sow in April in open ground in rows one foot apart and thin out as needed. To keep up a succession, sow frequently, as all varieties deteriorate rapidly.

## CUCUMBER.

1 oz. for 60 hills; 2 to 3 lbs. in hills for an acre.

Cucumbers succeed best in warm, rich, sandy loam. They should not be planted in the open air until there is a prospect of settled warm weather—in the vicinity of New York about the middle of May; plant in hills about four feet apart each way. The hills should be previously prepared, by mixing with the soil of each a shovelful of well-rotted manure. Plant eight or ten seeds in each hill. When all danger from insects is past thin out the plants, leaving three or four of the strongest to each hill. The fruit should be gathered when large enough, whether required for use or not, as, if left to ripen on the vines, it destroys their productiveness.

## EGG PLANT.

1 oz. for 1,000 plants.

The Egg Plant will thrive well in any good garden soil, but will repay good treatment. The seed should be sown in hotbed or warm greenhouse in March or April, and when about an inch high, pot in two or three inch pots. Plant out, about June 1st, two and a half feet apart. If no hotbed is at hand, the seeds may be grown in any light room where the temperature will average seventy-five degrees.

## ENDIVE.

1 oz. for 100 feet of drill.

Endive is one of the best salads for fall and winter use. Sow for an early supply about the middle of April. As it is used mostly in the fall months, the main sowings are made in June and July and transplanted one foot apart each way when of sufficient size. It requires no special soil or manure, and after transplanting, if kept clear of weeds until the plant has attained its full size, the process of blanching begins, which is effected by gathering up the leaves, and tying them by their tips in a conical form. This excludes the light and air from the inner leaves, which become blanched in from three to six weeks, according to the temperature. Another method consists in laying slats or boards on the plants as they grow, which serves the same purpose as the tying up. Endive may also be grown by sowing the seed and thinning out to one foot apart each way, as recommended for Lettuce.

## KALE, or Borecole.

1 oz. will sow 150 feet of drill.

If wanted for use in late fall or early winter, sow early in June and transplant, middle of July as directed for Cabbage. If needed for spring use, sow the Siberian about middle of August and transplant a month later. Of all the Cabbage tribe this is the most tender and delicate, and would be much more extensively grown than it is, if its excellent qualities were generally known. The varieties are all extremely hardy, and are best when touched by frost.

## KOHL RABI.

In latitude of New York sow in hotbed or warm window middle of February. When strong enough, transplant into rich well-manured soil in rows two feet apart and 9 to 12 inches apart in the rows. They should be used before fully grown, as they become tough with age.

## LEEK.

1 oz. will sow 100 feet of drill.

Sow as early in spring as practicable, in drills one inch deep and 18 inches apart; the plants should be thinned to stand 4 to 6 inches apart in the row. When six or eight inches high they may be transplanted in rows ten inches apart each way, as deep as possible, that the neck, being covered, may be blanched. The ground can hardly be made too rich, for the Leek is a gross feeder.

## LETTUCE.

1 oz. for 3,000 plants.

The cultivation of Lettuce is universal by all who have gardens, and from its tractable nature and freedom from insects and diseases, it is manageable in the hands of everyone. For early crop, seed may be sown in the open ground in the middle of September, and transplanted to coldframes as soon as large enough to handle, being wintered over in the same manner as early Cabbage. Seeds are also sown in well-protected frames in February, and in hotbeds in March, and by careful covering up at night will make large enough plants by April for spring planting. But for ordinary private use in the summer months, the simplest way is to sow it thinly in rows one foot apart, early in the spring, and thin out the plants so that they will stand one foot apart. This is easier than transplanting, and if sown every two or three weeks from middle of April to middle of August, Lettuce may be had in perfection the whole season. Lettuce plants may be carried through the winter without glass covering in southern parts of the country in dry, well-sheltered spots, by covering with leaves, hay or straw late in the season.

## MELON, Musk.

1 oz. for 60 hills; 2 to 3 lbs. in hills for an acre.

Melons thrive best in a moderately enriched light soil; the hills should be from three to six feet apart each way, according to the richness of the soil. If soil is poor or sandy, plant at four feet. Previous to planting, incorporate well with the soil in each hill a couple of shovelfuls of thoroughly rotted manure; plant eight or ten seeds in each hill early in May, for latitude of New York, for south earlier, for further north later, and when well up thin out all but three or four of the most promising seedlings.

## MELON, Water.

1 oz. for 30 hills; 4 to 5 lbs. in hills for an acre.

Watermelons require a rich though rather sandy soil for best development, and thrive best in warm latitudes, growing best in the Southern or Southwestern States, although in warm, sandy soils in this latitude fine crops are often obtained. Cultivate exactly as for Muskmelons, except that the hills should be eight and ten feet apart.

## MUSHROOMS.

Mushrooms may be grown in any shed, building or cellar where a temperature of 60 degrees can be maintained, and where a supply of fresh horse manure is available. See special culture directions on page 21.

## OKRA, or Gumbo.

1 oz. contains about 400 seeds.

It is of the easiest culture, and grows freely, bearing abundantly in any garden soil. It is sown at the usual time of all tender vegetables, in this section about the middle of May, in drills two inches deep, thinning the plants to two feet apart in row, rows 3 feet apart.

## ONION.

1 oz. for 100 feet of drill; 5 or 6 lbs. in drills for an acre.

For an early crop seed may be sown in coldframes in February, transplanting when large enough to handle. Regular open-ground sowing should be made about April 20th in latitude of New York, in soil that has been manured the previous year. Sow about one-half inch deep in rows eighteen inches apart, and thin out to two inches apart in the rows, and when plants are large enough thin again so the plants stand 3 to 4 inches apart. Weeds in the row should be removed by hand. If ground is liable to be weedy, it is well to sow a little radish with the Onion seed—to mark the row.

## PARSLEY.

1 oz. for 150 feet of drill.

Parsley succeeds best in a rich, mellow soil. As the seed germinates very slowly, three or four weeks elapsing sometimes before it makes its appearance, it should be sown early in spring, great care being taken that the drills be not more than an inch in depth and that the seed be well pressed down after sowing. Sow in rows a foot apart and half an inch deep. For winter use, transplant a few plants in the coldframe in early autumn, or a few plants may be placed in pots or boxes and kept in the kitchen window for convenient use in winter.

## PARSNIP.

1 oz. for 200 feet of drill; 5 to 6 lbs. in drills for an acre.

Sow as early in spring as the weather will admit, in drills eighteen inches apart, covering half an inch deep. When well up, thin out to five or six inches apart in the rows. Unlike Carrots, they are improved by frost, and it is usual to take up in fall a certain quantity for winter use, and store as directed for Turnips, leaving the rest in the ground until spring, to be dug up as required.

## PEAS.

1 qt. for 100 feet of drill; 2 to 3 bushels in drills for an acre.

Peas come earlier to maturity in light, rich soil. For general crop, a deep loam, or a soil strongly inclining to clay, is best. For early crops, decomposed leaves or leaf-mold, if convenient, may be used, or, if the soil is very poor, a good dressing of well-rotted manure should be used; for the dwarf-growing kinds the soil can hardly be too rich. When grown as a market crop, Peas are sown two to three inches deep, in single rows, from two to three feet apart, according to height of variety or the strength of the soil. When grown for private use they are generally sown in double rows, six or eight inches apart, and the tall varieties staked up by brush or our Pea Trellis. For an early crop, sow in February, March or April, according to latitude, as soon as the ground can be worked, and make repeated sowings every two weeks for succession. After the first of June sowing should be discontinued until August, when a good crop may be secured in the fall by sowing an extra early sort.

## PEPPER.

Sow  $\frac{1}{2}$  inch deep in hotbed, greenhouse or warm window, in March or April. When one inch high transplant into two-inch pots, and plant out June 1st in rich well-tilled soil thirty inches apart each way. Cultivate frequently throughout the season to keep the soil mellow and free from weeds.

## PUMPKIN.

1 oz. for 30 to 50 hills.

Sow in May in the latitude of New York, in very rich soil. When grown alone the hills should be eight feet apart each way. As soon as the seedlings are out of the ground sprinkle with air-slaked lime or land plaster mixed with dry garden soil or ashes. This prevents the ravages of striped beetle.

## RADISH.

1 oz. for 100 feet of drill; 9 to 10 lbs. in drills for an acre.

Radishes thrive best in a light, sandy loam. Heavy or clayey soils not only delay their maturity, but produce crops much inferior, both in appearance and flavor. For a continuous supply sow at intervals of two or three weeks from the middle of March until September. For extra early, sow in a hotbed in February, care being taken to give plenty of ventilation, otherwise they will run to leaves. If plaster is incorporated with the soil in the row at time of sowing seed, the Radishes will always turn out brighter in color, crisper, and of better quality.

Winter Radishes should be sown about the first of June, and cultivated as turnips.

## RHUBARB.

Sow in April, in drills a foot apart, thinning out to about the same distance apart in rows when a few inches high. The following spring transplant into deep, rich soil, about three feet apart each way. If propagated by dividing the roots, it may be done either in fall or spring, planting it at the same distance apart as given above. The soil cannot be too rich.



## SALSIFY, or Oyster Plant.

1½ oz. for 100 feet of drill.

The Oyster Plant succeeds best in light, well-enriched mellow soil, which, previous to sowing the seeds, should be dug to a depth of eighteen inches. Sow early in spring, in drills eighteen inches apart; cover the seeds with fine soil an inch and a half in depth, and when the plants are strong enough, thin out to six inches apart.

## SEA KALE.

Sow in the early spring in hills 3 by 2 feet apart, using eight or ten seeds per hill, and thin out to three or four plants per hill. Cover with 4 to 6 inches of manure in winter. As Sea Kale is only palatable when properly blanched, a covering of 12 to 15 inches of some light covering, such as leaf-mold, manure from a spent hotbed or mushroom bed, should be put over the plants early in spring. The young shoots will grow through this and blanch as they grow. Old roots can be taken up and forced in a warm cellar, hotbed or greenhouse by covering as above described.

## SPINACH.

1 oz. for 100 feet of drill; 10 to 12 lbs. in drills for an acre.

Sow thinly in rows twelve or fifteen inches apart. The main crop is sown in September. It is sometimes covered up in exposed places with straw or salt hay during winter, which prevents it from being cut with the frost, but in sheltered fields there is no necessity for covering. For summer use it may be sown at intervals of two or three weeks, from April to August. Spinach is best developed and most tender and succulent when grown in rich soil.

## SQUASH.

1 oz. for 50 hills; 3 to 4 lbs. in hills for an acre.

It is useless to sow until the weather has become settled and warm. Light, rich soils are best suited to their growth, and it is most economical of manure to prepare hills for the seeds in the ordinary manner by incorporating two or three shovelfuls of well-rotted manure with the soil for each hill, as is done for Melons. For bush varieties, from three to four feet each way, and for the running sorts, from eight to ten feet. Eight or ten seeds should be sown in each hill, thinning out after they have attained their third and fourth leaves, leaving two or three of the strongest plants.

## SWISS CHARD.

SWISS CHARD is a beet grown for its leaves, which are large, tender, succulent, and highly esteemed as a "fresh vegetable" on account of their agreeable flavor. The leaves are boiled like Spinach, either entire or with the stem and midrib removed. Sow the seed in April or May in drills 16 to 18 inches apart, and thin the plants to stand 10 to 15 inches apart in the rows. Cultivate occasionally, and do not let the plants suffer from lack of water. The leaves may be gathered during summer and fall, selecting only the best leaves.

## TOMATO.

1 oz. for 1,500 plants; ¼ lb. to transplant for an acre.

The seed should be sown in March in a hotbed, greenhouse, or inside the window of a room, where a night temperature of not less than sixty degrees is kept, in drills five inches apart and half an inch deep. When the plants are about two inches high they should be set out three inches apart in boxes three inches deep, or potted into three-inch pots, allowing a single plant to a pot. They are sometimes shifted a second time into larger pots, by which process the plants are rendered more sturdy and branching. About the middle of May, in this latitude, the plants may be set in the open ground, at a distance of three or four feet apart, in hills in which a good shovelful of rotted manure has been mixed. Water freely at the time of transplanting, and shelter from the sun until the plants are established. Tomatoes produce better fruits when staked up, or when trained against walls or fences. Grow to a single stem and keep all superfluous side shoots and other growth that excludes sunlight from the fruit pruned off.

## TURNIP.

1 oz. to 150 feet of drill; 1 to 2 lbs. per acre in drills.

Turnips do best in highly enriched, light or sandy soil; commence sowing the earliest varieties in April in drills, from twelve to fifteen inches apart, and thin out early to six or nine inches in the rows. For a succession, sow at intervals of a fortnight until the last week in May for early crop, and from August to September for late. August sowings may be made for the fall crop, at which season they grow best.

## HOW TO GROW "Prizetaker" Vegetables.

**T**HOSE who take pride in growing extra fine specimen vegetables for exhibition, their own satisfaction or to surprise their friends, may find some of the following hints an aid. The general details of culture for different vegetables given under their respective headings should be followed, supplemented by the following:

For exhibition vegetables the soil should be more carefully prepared than usual, dug deeper, "trenched" if possible, with an abundance of well-rotted manure so thoroughly incorporated with the soil that there will be no lumps. If such preparation can be accomplished the preceding fall the soil will be richer and in a more mellowed, friable condition than is possible with spring preparation. Deep, rich, mellow, under-drained soil is a prime factor in producing best vegetables. Other essentials are frequent cultivation not only to keep the weeds down but to form a surface mulch to conserve the soil's moisture. Grow the plants further apart than in ordinary garden culture and do not permit growth to be checked from lack of water during dry spells. Keep the plants well nourished with occasional applications of liquid manure, or, sprinkle about each plant and rake in about a tablespoonful of high-grade fertilizer once a week.

### OTHER CULTURAL DETAILS AS FOLLOWS:

**ASPARAGUS.**—The largest well-blanching Asparagus is produced by placing small drain-tiles or similar tubes over the strongest-appearing stalks and filling in with soil. When ready to cut, lift the tiles and the soil will fall away.

**BEANS.**—Stimulate growth before bloom by sprinkling about each plant a tablespoonful of nitrate of soda and rake in. When plants are fairly in bloom, apply occasionally in same way and same quantity some commercial fertilizer high in potash, or water with liquid manure. When pods begin to swell, pinch off the tops of the branches and remove all but 3 or 4 pods to a stalk.

**BEETS,** see **ROOT CROPS.**

**CABBAGE and CAULIFLOWER.**—Sprinkle around each plant and rake in once a week a tablespoonful of commercial fertilizer, or water with liquid manure.

**CARROT,** see **ROOT CROPS.**

**CORN.**—Each plant to stand 3 feet apart in the row; allow only 1 ear to a plant; feed with liquid manure once a week or rake in a tablespoonful of fertilizer about each plant.

**CUCUMBER,** see **VINES.**

**EGG PLANT.**—Allow only two fruits to a plant and feed with liquid manure or fertilizer as previously advised.

**MELON,** see **VINES.**

**ONION.**—Sow the seed thinly and transplant the seedlings 4 to 6 inches apart in extra rich soil and cultivate frequently.

**PARSLEY.**—Select the most perfectly curled, short-stemmed plants. Shade from sun after a rain to hold the color.

**PARSNIPS,** see **ROOT CROPS.**

**PEPPER.**—Thin out the branches to admit sun and air; allow but few fruits to a plant.

**PUMPKINS and SQUASH,** see **VINES.**

**TOMATO.**—Prune plants of superfluous growth and allow but two or three fruits to set on a branch.

**TURNIP,** see **ROOT CROPS.**

**ROOT CROPS. Beet, Carrot, Parsnip, Turnip, Ruta Baga.**—The soil if stony or pebbly should be dug out and sifted as deep as the roots are supposed to grow so they will come out smooth and free from surface indentations. The holes 2 to 3 feet deep and 3 inches or more in diameter for long-rooted beets, carrots, parsnips, etc., are best made with a posthole auger or digger, though a crowbar or spade may be utilized. Fill in with sifted soil mixed with pulverized, rotted manure. Sow 5 or 6 seeds in each and leave but one strong seedling in each hole.

**VINES. Cucumbers, Melons, Pumpkins, Squash.**—Make the hills further apart than advised for ordinary culture; incorporate plenty of well-rotted manure with the soil; leave but one or two of the strongest seedlings in a hill. When vines are of sufficient size pinch off ends of leaders and keep all superfluous growth removed. Pull a little soil over each joint of runners feeding fruit so they may take root. After the fruit has set, pull off all but one or two of the strongest to each lateral. Feed with liquid manure or fertilize as previously advised.

# The Fall Vegetable Garden.

## WHAT TO GROW FOR SUCCESSION.

But few amateur gardeners appreciate the fact that a continuous succession of most vegetables may be grown in the garden and thus supply the table until frost. In fact, many summer-sown vegetables yield larger and better products than the spring-sown. In the fall from spring planting we will have abbage, Cauliflower, Celery, Potatoes, Squash and Tomatoes, but many of the quick-maturing vegetables should also be enjoyed. We append a list of the kinds with latest dates for sowing in the latitude of New York City. The varieties chosen for late sowings should be "early" sorts because these come to maturity quicker than "late" varieties.

### Successional Sowings may be made up to the dates given:

Bush Beans.....	Aug. 15th	Kohl Rabi.....	July 15th
Beets, early varieties.....	Aug. 15th	Lettuce.....	Aug. 15th
Carrots, early varieties.....	Aug. 15th	Peas, early varieties.....	Aug. 1st
Corn, Sweet, early varieties.....	July 15th	Radish.....	Sept. 15th
Corn Salad.....	Aug. 15th	Spinach.....	Sept. 15th
Cucumber, for pickles.....	July 15th	Turnip, early varieties.....	Sept. 15th
Endive.....	Aug. 1st		

If Corn Salad, Lettuce and Spinach be covered lightly with hay or straw just before the first frost they may be gathered in perfection for several weeks later.

# Vegetables for Winter Use.

## WHAT AND HOW TO STORE.

A low temperature, evenly maintained a little above freezing, and a ventilated, slightly moist atmosphere is the desideratum for keeping most vegetables through the winter, thus checking the disorganizing work of over-ripening, fungus, rot and wilting. There are, however, exceptions which are detailed below. Store only sound, well-matured specimens. When one has a ventilated cold cellar in the house, the cold-storage problem is simplified, but in many homes the heat from the furnaces renders it impossible to keep vegetables for any length of time. Then outside storage must be resorted to. The simplest outdoor storage is "pitting" the suitable vegetables. An excavation or excavations are made in the garden a foot or more in depth, and of shape and size proportionate to the quantity of products to be stored. These are piled heaping full, forming a mound or cone over which straw or hay should be placed to a depth of 6 or 8 inches to protect from early frost. Just before freezing nights begin to throw an inch or two of soil over the straw and add a few more inches of soil before winter sets in hard. Vegetables keep splendidly when properly pitted, the only objection being they are difficult to get at in severe weather; for this reason an outdoor cellar is preferable. The outdoor cellar is made by digging an excavation about 2 feet in depth and of dimensions suited to the requirements and location. The sides of the excavation are kept in place by boards on edge, held in place by stakes; the upper edge of the boards should be a little higher than the level of the ground to permit the laying of boards to form a gable roof, the center resting on a ridge pole, held by posts 4 to 5 feet high. The board roof is sufficient protection until severe freezing weather, when hay, straw or leaves are thrown over the roof and a few inches of soil added. A door should be provided at one end, for convenience. On account of the amount of air contained in a cellar of this kind very uniform conditions are obtained. Not only may the hardy roots be stored in it, but also Celery, Cabbage, Brussels Sprouts, and Leek plants may be placed upright, roots on the ground, and will keep in prime condition.

## VEGETABLES FOR WINTER USE.

## What and How to Store.—Continued.

**BEETS.** Dig before severe frost. Cut off the tops but leave the roots on. Store in pit or outdoor cellar. If in house cellar, place in boxes; fill in with soil or sand to prevent shriveling.

**BRUSSELS SPROUTS.** Pull the plants after frost, leaving roots on. Stand upright on soil in the outdoor cellar.

**CABBAGE** requires to be kept in moist cold. Pull the plants, leaving all leaves, stems and dirt on. Place close together, heads down in a trench 1 foot deep. Cover with 6 inches of straw and before freezing weather add 3 or 4 inches of soil, and before winter sets in increase the soil, covering to a foot in thickness. Cabbage may also be stored in the outdoor cellar, standing them upright, the roots on soil.

**CARROTS.** Store as directed for Beets.

**CELERY** requires to be kept as cool as possible without freezing. For early winter use, it should be partially blanched in the garden; but for late winter use, it should be put away green. Store as late as possible but before freezing. One method is to dig a trench as deep as the Celery is high and as narrow as possible to pack the Celery snugly in an upright position, roots on the soil. Cover with straw, hay or leaves, then add 6 to 8 inches of soil. In the outdoor cellar it is stood up with roots on moist soil. In the house cellar store the Celery in narrow boxes or barrels not quite the height of the plants. A few inches of damp soil or sand is placed in the bottom; pack the Celery in upright with roots in contact with the sand; pack moderately tight to exclude the air so the Celery will not wilt. The moist sand at the roots will sustain it. The soil should be watered as often as needed to keep it from drying out—but water through holes about 8 inches apart bored through the boxes just above the soil or sand—do not wet the foliage or stalks. Thus packed and the boxes placed in a cool cellar, Celery will blanch and be fit to use in four to seven weeks, according to the variety.

**CORN SALAD.** Protect as advised for Spinach.

**KALE.** Stands right out in the garden. Pull leaves as required. Frost improves the flavor.

**LEEK.** Store green; leave roots and leaves on; place close together, standing with roots on soil or sand in the outdoor cellar or trench, like Celery.

**ONION.** Cool, dry air is best. When thoroughly cured remove tops and store on slatted shelves or in trays in a cold, airy, frost-proof loft or room. Damp air causes Onions to sprout.

**PARSNIPS.** Dig as late as possible, but, before frozen in, store in pit or outdoor cellar. If in house cellar place in boxes and fill in with sand or soil to prevent shriveling.

**POTATOES,** if dug in mild weather, are best left on the ground in a heap and covered with straw or hay to keep the sun off. Before freezing weather store in dry, cold cellar or pit.

**PUMPKIN and SQUASH** keep best in a dry atmosphere of loft or room at about 50°. If warmer they lose weight; if moist they rot. Gather before frost and leave the stems on.

**SALSIFY.** Follow directions given for Parsnip.

**WINTER SPINACH** remaining in the garden should be covered, after the ground has lightly frozen, with straw or hay to a depth of about 2 inches to check successive freezing and thawing.

**TURNIPS and RUTA BAGA.** As advised for Beets.

**TOMATO.** Gather the large, unripened fruits before frost and lay without touching each other on excelsior, hay or straw, to permit a circulation of air about them. Place in the shade in room of moderate temperature and they will continue to ripen and color up, sometimes lasting until Christmas.

## WHEN to GATHER SOME VEGETABLES at their best for TABLE USE.

**SNAP BEANS.** Before full size and maturity.

**BEETS.** Before full size and maturity.

**BRUSSELS SPROUTS.** After frost.

**CABBAGE.** Early sorts, when three-fourths headed.

**CARROTS.** For soups, while young.

**CORN.** In the milk, silk just browning.

**CUCUMBER.** Before color turns yellow.

**ENDIVE.** As soon as blanched.

**KALE.** After frost.

**KOHL RABI.** Before skin hardens.

**PARSNIP.** After frost.

**PEAS.** Immediately the pods are filled.

**RADISH.** Before maturity and pithiness.

**SPINACH.** Before flower spike appears.

**SQUASH, SUMMER.** Before shell hardens.

**SWISS CHARD.** Outer leaves when three-fourths grown.

**TURNIP.** Before fully grown.

# Mushroom Culture

Mushrooms may be grown either in a house, erected for the purpose, or in cellars, sheds, under greenhouse benches, or, as in France, in caves or other subterraneous places, for light is not necessary to their growth.

The substance called **spawn** is impregnated with the germs or spores found on the "gills" of the developed Mushroom. This **spawn** we plant to produce the Mushroom. The usual method of growing them, where there is a greenhouse, is to use the sheds or boiler pits; the portion used for Mushroom growing is generally 4 feet from the back wall, starting on the floor of the shed with the first bed, the additional beds being formed of shelving of the same width, and from 12 to 15 inches deep, raised one above another to the top of the wall. If a shed or cellar is used for growing Mushrooms exclusively, beds will be formed in the middle as well as against the walls, leaving, say, 3-foot walks between each tier of Mushroom beds. When a Mushroom bed is made under the greenhouse bench, the bench must be water tight to prevent any drip getting through. The bed must also be formed under benches having no pipe or flues below them. Where cellar-room is available, there is no better place to raise Mushrooms, for the cool, moist atmosphere and uniform temperature of the cellar is congenial to the growth of this vegetable. The beds may be formed as above recommended, or portable boxes may be used of the requisite depth and of convenient size. The temperature where Mushrooms are to be grown should range from 55 deg. to 65 deg., consequently, it would be useless to attempt to grow the crop unless congenial temperature can be maintained; for though the manure in the beds were up to 80 deg. when first made, it would only partially raise the temperature of an unheated building in winter. Probably the best time to begin making the beds for a crop wanted in winter is during August and September, as at that season the temperature is high enough to cause the spawn to germinate freely, so that the first beds made in August will give the first crop during December; those in September, in January or February; and so on. The following plan has been extensively practiced with rare instances of failure, even by those who never before attempted the culture of the Mushroom: "Let fresh horse droppings be procured from the stables each day, in quantity not less, perhaps, than a good barrowful. To every barrowload of droppings add about the same **weight** (which will be a little less than one-third in bulk) of fresh loam from a pasture, or sod land of any kind, that has not been manured; the danger of old manured soil being that it may contain certain spurious **fungi**. Let the droppings and soil be mixed together day by day as the droppings can be procured. If they can be had all at once in quantity enough, so much the better. Let the heap be turned every day, so that it will not heat violently, until you have got enough to form a bed of the dimensions required. Be careful that you keep it where it cannot get wet. Now, from this prepared compost heap, spread over the bed a thin layer; pound this firmly down with a brick, and so on till it reaches a depth of 8 inches. More than 8 inches will heat too violently, while less is hardly enough. Into this, plunge a 'hotbed' thermometer; in a day or two the heat of the bed may run up to 100 deg. or over; as soon as it declines to 90 deg., take a dibble, or sharp stick, and make holes, 3 to 4 inches deep all over the bed at 12 inches each way; into each hole put a piece of spawn about the size of a hen's egg, covering with the compost; level and firm the surface as before. Let it remain in this condition for about 10 or 12 days, by which time the spawn will have 'run' through the whole bed. Now spread evenly over the surface of the bed nearly 2 inches of fresh loam; firm it down moderately with the back of a spade, and cover up the bed with 3 or 4 inches of hay or straw. **Inattention to the detail of permitting the bed to 'spawn' thoroughly before the top layer of soil is put on, often causes failure, for if covered too soon, the temperature of the shut-in heat and steam rises and destroys the spawn.** This completes the whole operation of 'planting the crop.' Nothing now remains to be done but to attend to the heat and moisture. If the place can be kept uniformly at 60 deg., all the better. It should never get below 40 deg., else the bed will cool and delay the crop. Unless the air of the house has been unusually dry, the Mushrooms will appear before water is required; but examination should be made, and if the surface of the bed appears dry, a gentle sprinkling of water, heated to about 100 deg., must be given. The Mushrooms do not come up all at once, but should commence to appear in from 10 to 12 weeks from spawning the bed, and will continue for 3 to 4 weeks. After this first crop, a slight dressing of fresh soil about half an inch in depth, spread over the bed, and again beaten down with the spade; this is gently watered with tepid water when dry, and a second crop of Mushrooms (often better than the first) is gathered in 4 to 8 weeks' time."

**Field Culture of the Mushroom in Northern States.** When the conditions are suitable, Mushrooms can easily be grown in the open field or lawn, by planting the spawn in rich, old, well-drained grass lands (avoid dry, sandy, wet or shady locations). In the vicinity of New York, the month of June is the time for planting. Make a V-shaped cut about 4 inches deep in the sod with a spade, inserting a piece of spawn 3 inches square, placing it 2 inches below the surface, afterwards tramping the sod firmly back in place, so that it will retain moisture. Place each insertion about 3 feet apart. The Mushrooms should appear during August and September.

## How to Grow Globe or "French" Artichokes

In France, Italy, Great Britain, etc., these are extensively grown, almost every garden having at least a few plants. The fleshy scales and soft base of the flower heads being the portions so much esteemed, these parts may be eaten raw, but are usually boiled and served with butter sauce or as "Artichoke Salad" or are pickled after cooking; the suckers or young side plants may also be tied together to blanch and be used as Asparagus. Also the mid-ribs of the larger blanched leaves may be used as "Chard."

The Globe Artichoke is a large-growing, thistle-like, quite ornamental perennial, and is fairly hardy, though in cold climates the crowns should be protected with a covering of leaves, straw or stable litter, after the old stems have been cut off and the large leaves shortened. Should an extra covering of earth be advisable, be careful that none gets into the heart of the crown.

The plants should be grown 2 to 3 feet apart in rows 3 to 4 feet apart. But few plants will be required for the family garden as established plants produce a number of flower heads each year. All flower heads should be removed even if not used, for if allowed to ripen, they reduce the vitality of the plant; and when gathering the heads if the whole stem is also cut off near the ground, new suckers and flower stems will shortly appear, thus keeping up a successive supply of edible heads until late in the season.

Globe Artichokes are grown both from seed and suckers taken from the old plants. On account of their variability from seed, the sucker method is frequently preferred, for plants from these produce true to the parents, and only the best of the latter need be chosen.

Plants from seed sown very early under glass or in a spent hot bed—the seedlings potted off and afterwards transplanted to the garden—will produce flower heads late the first season. Those sown later in the garden seed bed—the young plants transferred to their permanent quarters when large enough—will commence bearing the next season. Established and old plants produce around the neck, underground, a number of suckers or young offset plants which replace the stems which flowered the season before. These young side shoots are usually too numerous for all to develop equally well. Therefore it is the practice in spring to remove sufficient soil around the old stools and detach all suckers but two or three of the strongest which will supply the first or main crop for that season. Care should be used to wound the old plant as little as possible, else it might rot away. If some of the detached suckers are wanted for a new plantation they should be removed with a "heel," that is a portion of the root of the old plant; an Asparagus knife or paddle trowel is handy for the operation. Then with a pruning knife, trim from the "heel" all bruised or torn parts. Shorten the leaves a little and plant out in the "nursery bed" so that watering and shading can be attended to if needed until the young plants are well rooted, which should be in from 4 to 6 weeks' time, then transplant them in their permanent places and they will yield an abundant supply of flower heads in the autumn.

It is advisable to start a few new plants each year and discard the old plants after their fourth year of bearing, the plants being at their best during their second and third years.

Globe Artichokes will grow in almost any soil, but attain greatest perfection in well-dug, deep, rich, moist loam. Low lying black valley or "bottom" land is ideal if well drained, but the plants will not live over winter in wet land. Good cultivation and a mulching of manure every spring with applications of manure water during dry weather will induce the liberal production of immense succulent heads.

## Witloof—The New Christmas Salad

This large-leaved variety of Chicory—when especially grown and blanched—forms the so-called "New Christmas Salad" long known in Europe as "Witloof." It is very easily grown from seed sown in the open ground in spring, where it makes long Parsnip-like roots by fall if the seedlings are thinned to stand 5 to 6 inches apart and kept well cultivated; it is usually the leaves that are used, the outer ones being discarded, the inner or crown leaves being blanched by various practices, and eaten raw as salad, or boiled and served like Cauliflower. The simplest way to blanch the leaves is to bank the plants over with earth, like Celery, in the fall. The European method, however, is a little more trouble, but probably produces better "Witloof." The roots are dug at the beginning of winter, all leaves cut off  $1\frac{1}{2}$  inches from the neck, the largest and best roots selected and then replanted 1 to 2 inches from each other in a trench dug deep enough to allow 8 inches of fine soil to cover the tops, in which new leaves will grow, and being weighted with soil they grow incurved, and together, forming small, well-blanched heads like small Cos Lettuce, the quality being then especially tender, crisp and free from bitterness. The leaf heads are cut off as required with a portion of the root attached, so the leaves will not fall apart. If a portion is wanted earlier, a covering of manure  $1\frac{1}{2}$  to 3 feet in depth over a section of the trenched roots will raise the temperature below so the leaves will have attained their proper size in about a month's time. Those not so covered will be correspondingly later, so that a succession may be enjoyed.

Another way is to dig and store the roots in a cool place, so they will remain dormant, and plant a few at intervals—either in boxes or large pots—for succession during the winter; place under a greenhouse bench, or in a warm shed or cellar. It requires from 4 to 6 weeks to produce the heads of leaves in a temperature of 55 to 60 degrees. If too warm a spindling growth will result. Inverted pots, soil, or other methods of keeping the tops dark so they will blanch, may be utilized. The heads of leaves after being cut must be kept from the light or they will quickly turn green.



# SEEDLINGS

## OF VARIOUS

# Vegetable Plants

Many of our friends, who are beginners in gardening work, have written us that they are often at a loss to distinguish the seedlings of the different varieties of vegetable seeds they have sown, from the seedlings of weeds which will appear in every seed-bed. In order to assist them we publish on the four following pages, drawings from nature of seedlings of the principal vegetables. Most seedlings of vegetable plants look alike when they first appear above ground; owing to the fact that the first leaves to appear are so similar. These leaves are termed cotyledons or seed-leaves, and in most cases are produced in pairs. There are some exceptions to this rule, however—notably the cotyledons of corn and other cereals, also onions and other hollow-stemmed plants, which put forth only a single seed leaf. These seed-leaves may be easily recognized in the drawings by their smooth appearance, and lack of serrations. Between them appears the plumule, or top; and from this the first true leaves are developed. Cotyledons or seed-leaves might well be called feeding-leaves, as they contain stored up food for the young seedlings to draw upon until they become firmly rooted in the soil. When this is accomplished the true leaves appear, and the plant can be identified.

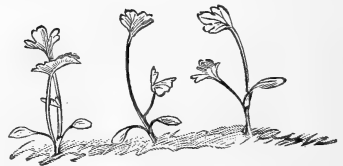
BEEF



BEANS



CABBAGE



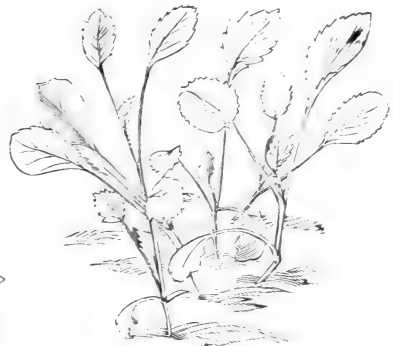
CELERY



SEEDLINGS OF VEGETABLE PLANTS.—Continued.



CUCUMBER



CAULIFLOWER



CARROT



CORN

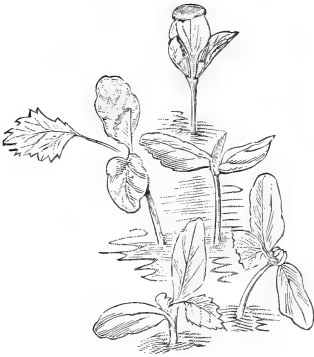


EGG PLANT

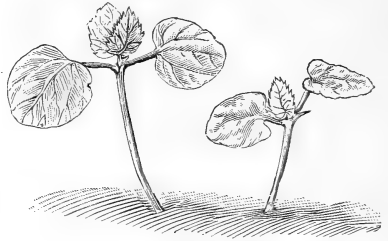


LETTUCE

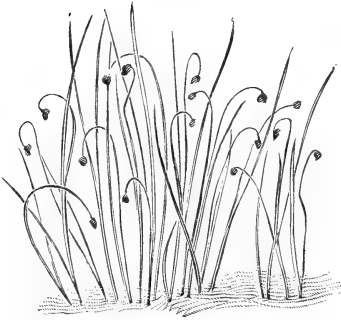
SEEDLINGS OF VEGETABLE PLANTS.—Continued.



MUSK MELON



OKRA OR GUMBO



ONION



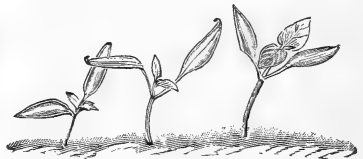
PARSLEY



PEAS



PARSNIP



PEPPER

SEEDLINGS OF VEGETABLE PLANTS.—Continued.



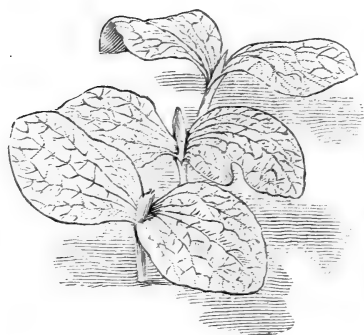
RADISH



SALSIFY



SPINACH



SQUASH



TURNIP



TOMATO

# Names of Vegetables in Various Languages

From Dr. Bailey's Horticulturist's Rule Book

<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
Artichoke.....	Artichaut.....	Artischöke.....	Cinauco.
Asparagus.....	Asperge.....	Spargel.....	Esparrago.
Bean, Broad.....	Fève de Marais.....	{ Grosse Bohne and Garten Bohne..... }	Haba.
Bean, Kidney.....	Haricot.....	Türcksche Bohne.....	Judias and Fasoles.
Beet.....	Betterave.....	Rothe Rübe.....	Betarraga.
Borecole.....	{ Chou vert or Non pommé..... }	Grüner Kohl.....	Col.
Broccoli.....	{ Broccoli and Chau brocolis..... }	Italienischer Kohl.....	Broculi.
Brussels Sprouts...	{ Chou de Bruxelles or à jets..... }	Sprossen Kohl.....	—————
Cabbage.....	Chou pommé or Cabus	Kopfkohl.....	Berza.
Cardoon.....	Cardon.....	Kardon.....	Cardo.
Carrot.....	Carotte.....	Möhre or Gelbe Rübe...	Chirivia.
Cauliflower.....	Chou-fleur.....	Blumen Kohl.....	Berza florida.
Celery.....	Célieri.....	Sellerie.....	Appio hortense.
Chicory or Succory.	Chicorée Sauvage....	Gemeine Cichorie.....	Achicoria.
Cress, Garden.....	Cresson.....	Gemeine Garten Kresse.	Mastuerzo.
“ Water.....	Cresson de Fontaine..	Brünnen Kresse.....	Bertero.
Cucumber.....	Concombre.....	Gurke.....	Pepino or Cohombro
Egg Plant.....	Melongène, Aubergine	Tollapfel and Eierpflanze	Berengena.
Endive.....	{ Chicorée des Jar- dins, Endive... }	Endivie.....	Endivia.
Garlic.....	Ail.....	Knoblauch.....	Ajo.
Horse-Radish.....	{ Cranson or le Grand Raifort }	Meerrettig.....	Rabano picante.
Kohl-Rabi.....	Chou-rave.....	Kohl Rabi.....	—————
Leek.....	Poireau.....	{ Gemeiner Lauch or Porro Zwiebe..... }	Puerro.
Lettuce.....	Laitue.....	Gartensalat and Lattich.	Lechuga.
Melon, Musk.....	Melon.....	Melone.....	Melon.
Mint, Common....	Menthe des jardins...	Munze.....	Menta.
Mushroom.....	Champignon comestible	{ Essbare Blätter- schwamme..... }	Seta.
Mustard.....	Moutarde.....	Senf.....	Mostaza.
Onion.....	Oignon.....	Zwiebel.....	Cebolla.
Parsley.....	Persil.....	Petersilie.....	Perejil.
Parsnip.....	Panais.....	Pastinake.....	{ Chirivia and Pastinaca. }
Pea.....	Pois.....	Erbse.....	Guisante.
Pepper, Red or Chile	Piment.....	Spanischer Pfeffer.....	Pimiento.
Potato.....	Pomme de Terre.....	Kartoffel.....	Patatas Inglezas.
Pumpkin.....	Courge.....	Kürbis.....	Calabaza.
Radish.....	Radis and Rave.....	Rettig and Radies.....	Rabano.
Rhubarb.....	Rhubarbe.....	Rhabarber.....	Ruibarbo.
Sage.....	Sauge.....	Salbey.....	Salvia.
Salsify.....	Salsifis.....	{ Haferwurzel and Bocksbart..... }	Barba Cabruna.
Savoy.....	{ Chou de Milan or pommé fraisé.... }	Wirsing or Herzkohl....	Berza de Saboya.
Sea Kale.....	{ Chou marin and Crambé..... }	Meerkohl.....	Col marina.
Spinach.....	Épinard.....	Spinat.....	Espinaca.
Thyme.....	Thym.....	Thimian.....	Tomillo.
Tomato.....	Tomate.....	Liebesapfel.....	Tomate.
Turnip.....	Navet.....	Rübe.....	Nabo.
Watermelon.....	Melon d'Eau.....	Wassermelone.....	Sandia.

# Condensed Cultural Instructions FOR FLOWER SEEDS.

The letter following the variety indicates which culture is to be followed  
(see pages 30 and 31).

Abronia.....	A	Clarkia.....	U	Humulus.....	F	Pennisetum.....	F
Abutilon.....	N	Clematis.....	V	Hyacinthus.....	O	Pentstemon.....	V
Acacia.....	S	Cleome.....	F			Perilla.....	D
Achillea.....	V	Clianthus.....	D	Ice Plant.....	A	Petunia.....	D
Acroclinium.....	M	Cobæa.....	D	Impatiens.....	N	Phlox, annual.....	F
Adlumia.....	G	Coccinea.....	F	Incarvillea.....	U	" hardy.....	V
Adonis.....	F	Cockscomb.....	A	Inula.....	V	Physalis.....	A
Ageratum.....	F	Coleus.....	D	Ipomœa.....	F	Pinks, annual.....	U
Agrostemma.....	A	Collinsia.....	U	Ivy, English.....	V	" hardy.....	V
Alyssum.....	F	Convolvulus.....	F			Platycodon.....	V
" perennial.....	V	Coreopsis, hardy.....	V	Kaulfussia.....	U	Polyanthus.....	C
Amaranthus.....	A	Cosmos.....	A	Kenilworth Ivy.....	V	Poppy, annual.....	P
Ampelopsis.....	V	Cowslip.....	C	Kochia.....	A	" hardy.....	V
Anchusa.....	V	Crepis.....	U	Kudzu Vine.....	V	Portulaca.....	F
Anemone.....	V	Cucumis.....	F			Primula, tender.....	E
Angelonia.....	N	Cuphea.....	A	Lantana.....	N	" hardy.....	C
Antirrhinum.....	A	Cyclamen.....	B	Larkspur, annual.....	U	Pyrethrum, hardy.....	V
Aquilegia.....	V	Cypress Vine.....	F	Lathyrus latifolius.....	V	" golden-leaved.....	Q
Aralia.....	N			Lavatera.....	F		
Arctotis.....	A	Dahlia.....	O	Lavender.....	V	Rehmannia.....	N
Aristolochia.....	V	Datura.....	F	Laya.....	U	Rhodanthe.....	M
Arnebia.....	A	Delphinium.....	V	Lemon Verbena.....	N	Rhodochiton.....	N
Asparagus.....	V	Dianthus, annual.....	U	Leptosiphon.....	U	Ricinus.....	F
" Verticillatus.....	V	" hardy.....	V	Linum.....	U	Rocket.....	V
" plumosa.....	S	Digitalis.....	V	Lobelia, annual.....	Q	Rose, monthly.....	I
" Sprengeri.....	S	Dimorphotheca.....	A	" hardy.....	V	" hardy.....	V
Asters.....	A	Dolichos.....	F	Lupinus.....	U	Rudbeckia, annual.....	U
Auricula.....	C	Dracæna.....	N	Lychnis.....	V		
				Malope.....	F	Salpiglossis.....	A
Balloon Vine.....	F	Echinocystis.....	F	Mallow.....	F	Salvia.....	A
Balsam.....	A	Edelweiss.....	V	Marigold.....	F	Scabiosa.....	F
Bartonia.....	U	Eschscholtzia.....	U	Marvel of Peru.....	F	" perennial.....	V
Begonia.....	S	Euphorbia.....	F	Mathiola.....	F	Schizanthus.....	F
Bellis.....	C			Matricaria.....	D	Silene.....	F
Bignonia.....	V	Ferns.....	S	Maurandia.....	D	Smilax.....	N
Brachycome.....	F	Fuchsia.....	N	Mesembryan- themum.....	F	Stevia.....	A
Browailla.....	A			Mignonette.....	U	Stocks, annual.....	A
Bryonopsis.....	F	Gaillardia.....	F	Mimosa.....	D	" biennial.....	I
		" perennial.....	V	Mimulus.....	D	Stokesia.....	V
Cacalia.....	U	Geranium.....	N	Mina.....	J	Sunflower.....	F
Calampelis.....	A	Geum.....	V	Momordica.....	F	Swainsonia.....	S
Calandrinia.....	P	Gilia.....	U	Moon Flower.....	F	Sweet Pea.....	E
Calceolaria.....	B	Gladiolus Seed.....	O	Morning Glory.....	F	Sweet Sultan.....	F
Calendula.....	F	Globe Amaranth.....	M	Musa.....	K	Sweet William.....	V
Calliopsis, annua.....	P	Gloxinia.....	S	Myosotis.....	C		
Campanula.....	V	Godetia.....	U	Nasturtium.....	F	Tagetes.....	F
Canary Vine.....	F	Golden Rod.....	V	Nemesia.....	N	Thunbergia.....	F
Candytuft.....	U	Gourds.....	F	Nemophila.....	U	Torenia.....	D
" hardy.....	V	Grevillea.....	N	Nicotiana.....	D	Tritoma.....	O
Canna.....	O	Gypsophila.....	F	Nclana.....	U	Tropæolum.....	F
Canterbury Bell.....	V	" hardy.....	V			Valerian.....	V
Carnation.....	T	Helichrysum.....	M	Oenothera.....	A	Verbena.....	A
Celastrus.....	V	Heliotrope.....	N	Oxalis.....	F	Violet.....	C
Celosia.....	A	Helenium.....	V			Virginian Stock.....	U
Centaurea.....	U	Heuchera.....	F	Pæonia.....	V	Viscaria.....	U
" white-leaved.....	Q	Hibiscus, annual.....	F	Palava.....	U		
Centrosema.....	V	" hardy.....	V	Pansy.....	C	Wallflower.....	V
Chrysanthemum.....	U	Hollyhock, hardy.....	V	Passion Flower.....	N	Wistaria.....	V
" annual.....	U	" annual.....	A	Pelargonium.....	N		
" perennial.....	T	Honeysuckle.....	V			Zea.....	F
Cineraria.....	B	Humea.....	Q			Zinnias.....	F
" white-leaved.....	Q						

# Condensed Cultural Instructions FOR FLOWER SEEDS.

For Key see preceding page.

**A** Sow in shallow boxes of light soil in the greenhouse, hotbed or light window, in a temperature of from 60 to 70 deg., covering the seeds to a depth of only four times their size, press down with a board firmly, water with a fine spray, and do not allow the seedlings to dry out. Transplant 1 inch apart into similar boxes or 2-inch pots, when the seedlings have formed 2 or 3 leaves. Plant out in the garden after danger from frost; the seed can also be sown in the open ground after danger is over from frost.

**B** Sow in shallow boxes of light soil in a greenhouse, hotbed or light window, in a temperature of 50 to 60 deg., at any time except during hot weather (spring months preferred). Merely press the seed in the soil with a board, rub a little light soil through a fine sieve over them until covered not over 1-16 of an inch deep; water with a fine spray, and do not allow them to dry out. When they have formed 2 or 3 leaves transplant 1 inch apart into similar boxes, and pot off as soon as large enough and shift as the pot fills with roots, until the size of the pots get to be 6 to 7 inches.

**C** For early flowering sow in the fall in a bed of fine, well pulverized soil, cover the seeds not deeper than four times their size, and press down firmly with a board. Transplant when 2 or 3 leaves have developed, about two inches apart, into a coldframe; cover with mats during very cold weather. Sow also in the spring in shallow boxes, in a temperature of about 60 deg., and transplant 1 inch apart into similar boxes when 2 or 3 leaves have developed; plant out as soon as the frost is out of the ground. They succeed best in a moist, loamy soil, partially protected from the hot sun.

**D** Sow in light soil, in shallow boxes (2 inches deep), placed in hotbed, greenhouse or window, in a temperature averaging 60 to 70 deg.; cover the seeds to not over four times their size, press down with a board firmly, water with a fine spray, and do not allow the small seedlings to dry out. Transplant 1 inch apart into similar boxes when they have formed 2 or 3 leaves, and plant out in the open garden after danger from frost, or pot in 2-inch pots and plant out from these, or shift into larger pots as the pot fills with roots, providing large plants in pots are desired.

**E** Sow in the spring in the open ground where they are to grow; the soil should be prepared deep; the sooner the seeds can be got in the better. Thin the seedlings to 6 inches apart. They delight in a moist, loamy soil and should be sown two inches deep; should the soil be light four or five inches deep would be better, and the soil should be well firmed down. If not allowed to go to seed they will flower much longer.

**F** Sow out of doors when danger from frost is over. The soil should be well pulverized, the seed covered to a depth of about four times its size with light soil; press down firmly with a board, and thin out so that the plants are not crowded. They can also be sown in shallow boxes (2 inches deep) in the greenhouse, hotbed, or in light window of dwelling house, if desired early; transplant into similar boxes when two or three leaves have formed, and plant out in the open ground after danger is over from frost.

**G** Sow in the spring in the open ground where the plants are to remain. Cover the seeds with light soil to a depth of not over four times their size; press down firmly with a board, and thin out as becomes necessary, so that they are not crowded. Protect the roots in the winter by a covering of leaves or straw.

**I** Sow in shallow boxes of light soil in greenhouse or hotbed, covering the seed to a depth of not over four times their size. When the seedlings have formed 2 or 3 leaves, transplant into similar boxes, and plant out in the open ground after danger from frost is over; if sown early they will flower the first year. If not sown early they will have to be taken up, in cold localities, potted off and kept in cool greenhouse or "heeled in" in protected frames during the winter. Sow also in a well pulverized bed in the open ground during the spring or summer, and care for in winter in the same way.

**J** Sow in light soil, in shallow boxes (2 inches deep), in a warm greenhouse, hotbed or light window of dwelling house, covering the seeds to a depth of not over four times their size. When the seedlings have formed 3 or 4 leaves, transplant into similar boxes one inch apart. If a profusion of flowers is desired, they should be potted off when about one inch high into 2 1/2 inch pots, and allowed to become pretty well rootbound, which checks their luxuriant growth and throws the vigor into the flowers. Plant out in the garden after danger of frost is over.

**K** Plant the seeds in shallow boxes (2 inches deep) in light soil mixed with coconut dust, leaf-mold or well-rotted manure, about one inch apart and a half to one inch deep. Place in a warm situation, at a temperature of not less than 70 degrees, either in the greenhouse, hotbed, or window. When the seedlings are large enough, pot off singly into small pots and shift into larger pots as it becomes necessary.

**M** Sow out of doors when danger of frost is over, cover the seed a depth of only four times their size, press down firmly with a board, and thin out so that the plants never become crowded. If desired early sow in shallow boxes in greenhouse, hotbed or light window, in a temperature averaging 70 deg., and transplant into similar boxes, when 2 or 3 leaves have developed. If desired to keep flowers as everlastings cut when the buds are a little more than half opened, and suspended in a dark, dry place, with the heads down until fully dry.

**N** Sow in shallow boxes (2 inches deep) of light soil, in greenhouse, hotbed or light window of dwelling house in a temperature averaging 65 deg.; cover the seeds to a depth of only four times their size; press down firmly with a board, and when two or three leaves have formed transplant one inch apart into similar boxes. Water with a fine spray, and do not allow them to dry out when small. Pot off as soon as large enough, and re-pot as they grow, into larger pots, or they can be planted out in the open ground for the summer, after all danger of frost is over.

**O** Sow in shallow boxes (2 inches deep) of light soil in greenhouse, hotbed or light window of dwelling house, in an average temperature of 65 deg. Transplant one inch apart into similar boxes when two or three leaves have developed, and plant out in the garden after all danger of frost is over. In the fall the roots should be taken up and kept in sand in a cool, dry place, such as a cellar. Sowings can also be made in the open ground in the spring, after danger of frost is over.

**P** Sow in the open ground after danger from frost is over, in beds of well-pulverized soil. The plants should remain where sown, as they will not stand transplanting unless done with extraordinary care. Thin out carefully so as to disturb the remaining plants as little as possible. For succession of bloom, two or three sowings can be made at intervals during the summer.

**Q** To get good sized plants for planting out in the spring the seed should be sown in shallow boxes (2 inches deep) in greenhouse, hotbed or light window of dwelling house, as soon as possible after January 1st, in light soil, in a temperature averaging 60 deg. Cover the seeds to a depth of not over four times their size, and press down firmly with a board. When the seedlings have formed 2 or 3 leaves, transplant into similar boxes one inch apart, and when large enough, pot off into 2½ inch pots. Plant out in the open ground after danger from frost is over.

**S** Sow in shallow boxes (2 inches deep) in light soil, in a temperature of 70 degrees, in the greenhouse or light window of dwelling house. Merely press the seeds into the soil with a board, and always water with a fine spray so as not to disturb the surface, and do not allow them to dry out. Place a pane of glass over the top, allowing a little space for the air to penetrate. Place in a partially shaded situation, and when 2 or 3 leaves have developed, transplant into similar boxes and pot them off when large enough.

**T** Sow in the spring in the greenhouse, hotbed or light window of dwelling house, where the temperature will average 60 degrees, in shallow boxes (2 inches deep) of light soil. Cover the seeds to a depth of only four times their size; sprinkle with a fine spray, and do not allow them to dry out. When the seedlings have formed 2 or 3 leaves, transplant into similar boxes 1 inch apart. When the seedlings are 1 or 2 inches high, pot in 2½ inch pots and shift into larger ones as they grow; or plant them in the open ground, where they will form flowering clumps for the fall and winter.

**U** Sow out of doors after danger from frost, and for succession of bloom at intervals during the summer. For early flowering, sow in greenhouse, hotbed or some window of the house facing south or southeast, in shallow boxes (2 inches in depth is ample) in an average temperature of 60 degrees; transplant the seedlings into similar boxes when 2 or 3 leaves have developed, and plant in the open ground after danger from frost is past. Also, sow in the garden in May, in light soil, cover not deeper than four times the size of seed, press firmly with a board, and water with a fine spray; do not allow the seedlings to dry out when small.

**V** Sow out of doors after danger from frost is over, in beds of finely pulverized soil, covering the seeds to a depth of not over four times their size, with light soil; press down with a board; thin out as it becomes necessary. Transplant into permanent position as soon as the seedlings are large enough so that they can become thoroughly rooted or established before cold weather, or sow in the early fall, carry the plants over in a coldframe, and transplant to permanent positions in the spring.

# How to Grow Asters.

**CALLISTEPHUS SINENSIS** is the botanical title of the original single-flowered Aster that came from China in 1731. The evolution of Asters since that time has brought forth remarkable variations and improvements, the double forms having become universally popular garden annuals.

A prolonged garden display of Asters may be enjoyed by growing the early, medium and late flowering sorts, yet the early flowering Asters are less desirable than those following. Therefore, for most brilliant garden effects, the medium-late and late flowering sections are usually chosen, and to have a successional display of these, the seeds should be sown at intervals of three or four weeks from February until June. For earliest flowers the seeds and seedlings of the early sorts will require to be sown and grown on under artificial conditions until "planting-out time" in May. The sowings of later varieties may be made in the open ground.

Among the "secrets of success" in raising Asters to perfection, we may mention that the plants should receive no check in their growth, from the seedling stage to bud development; they are very impatient of violent changes in temperature, and a high temperature is at no time desirable; sixty degrees seems to be the best for highest development.

The plants should be grown cool, especially when young; bottom heat in germinating Aster seed and growing the seedlings is a mistake. With plenty of air included in a temperature limited from 55 to 65 degrees, sturdy healthy seedlings are produced with resultant flowers far larger and finer—other conditions being congenial—than those eventually borne by spindly, heat-grown seedlings.

Asters, though surface-rooting plants, are almost as gross feeders as Roses, therefore, for best results an abundance of food and moisture must be continuously furnished, a well-enriched loamy soil deeply worked, being essential to induce the roots to go down for their supplies, where the soil temperature and moisture are more equable than on the surface, thereby rendering the plants less susceptible to drought, heat and checks; when the roots are confined to the surface without top dressing they are liable to dry out and the plants to starve.

**SEED SOWING AND SEEDLINGS.** When Aster seeds are sown early under glass, shallow boxes (2½ to 3 inches deep), pots or earthen seed pans may be used, either of the latter two being preferred on account of watering, which may be done when required by immersing for half an hour the pot or pan nearly to the surface of the soil, this method being preferable to surface sprinklings, reducing any tendency of the seedlings to damp off. The best compost for sowing the seed and growing the seedlings in, is prepared by mixing decayed leaf-mold with enough loamy soil to render it fairly firm, and with a sufficient admixture of sand to facilitate drainage.

Sow the seed thinly and just cover from sight by sifting over them some of the soil. Give no water unless the soil becomes decidedly dry and then it is better to immerse the seed pan in water than to wet the surface, as previously explained. A sheet of glass laid over the seed pan prevents rapid evaporation and hastens germination, but the glass should be removed as soon as the seedlings are above the soil, or it would draw them up slim and spindling, particularly if the temperature is too warm and not sufficient air given.

The seed pans may be placed in a cool greenhouse, sunny window, coldframe or pit, or spent hotbed, always keeping in mind that an equable temperature of about 60 degrees including air on every suitable occasion produces the best plants. When the seedlings have attained the third leaf, they should be transplanted about an inch apart, with the aid of a sharpened stick about the size of an ordinary pencil, into other seed pans or shallow boxes containing fresh soil of a similar nature to that already advised. This checks the tendency to damp off, so liable to happen when seedlings are crowded too long in their original seed bed, and besides, it gives the individual seedlings room to develop a stocky growth. In a couple of weeks' time, if the seedlings have been grown properly they may be potted off singly into 2 or 2½ inch pots and be grown on until "setting-out time" in May.

**OPEN-GROUND SOWINGS,** of the medium-late and late varieties, may be made at intervals of two to three weeks from early May during June for late-flowering plants. As congenial soil and weather conditions for germinating Aster seeds in the open garden are not always to be secured, we strongly advise that a special seed bed be prepared in a sheltered position. The soil should be rich, finely worked and friable with some wood ashes.



**HOW TO GROW ASTERS.—Continued.**

soot, or a dusting of lime incorporated with the soil in the drills. A shutter made of laths with  $1\frac{1}{2}$ -inch openings, supported by stakes over the bed, will break the force of the sun and check evaporation from the soil, and prevent a crust from forming on the surface, through which seedlings cannot always penetrate, or thin muslin may be substituted for the shutter.

**ASTER IN BEDS AND BORDERS.** Asters to be grown and flowered in perfection require a richly manured, loamy soil, worked deep and fine. A gravelly subsoil is the ideal for drainage, but if the subsoil is heavy, it should be under-drained if possible; if not, then loosen it, but do not bring any subsoil to the surface. The condition of the soil is important in Aster culture for best results for the plants are hearty feeders, and we must get them to root as deeply as possible for reasons before explained. Keep the ground free from weeds and frequently stirred, but do not go deep enough to injure the surface roots. When well in bud, a top dressing of rotted stable manure among the plants not only assists in nourishing the plants, but keeps the surface of the soil cool and moist. It is only when grown under such conditions that really fine flowers can be produced and the plants hold out. Fresh manure should never be used in Aster culture, as it often causes the plants to look scorched. Occasional applications of liquid fertilizer, or manure water, not too strong, nor must it touch the foliage, greatly assists in producing magnificent flowers.

The immense long-stemmed Aster flowers so often seen in the florist's windows and at exhibitions are produced by allowing the well-grown plants to carry but five or six main stems, each with its terminal flower; all other stems, side branches and buds are removed to throw the full vigor of the plant into the few flowers remaining.

Large-growing Asters, such as tall types of Victoria, Perfection, Comet, Invincible, Simple's, etc., should be planted about 12 inches apart. The medium-dwarf types; Mignon, Dwarf Chrysanthemum-flowered, Dwarf Victoria, etc., 10 inches apart, while the compact Tom Thumb or edging Asters should go 6 inches apart.

Asters, especially those of the dwarf compact types, are very decorative as pot plants; for this purpose it is only necessary to lift the plants when in bud, disturbing the ball of earth as little as possible, and pot them. Water them liberally; shade for a few days from the hot sun until root action has resumed.

## How to Grow Pansies.

The pansy is hardy with slight protection, and thrives best when grown cool. In hot exposed situations its deteriorates rapidly. Two methods of raising pansy seedlings are practiced; one in autumn, and the other in spring.

**PANSIES FROM AUTUMN-SOWN SEED.** Sow the seed thinly in July or August in the open ground on a finely prepared seedbed sheltered from hot sun, or protect with a light covering of salt hay or straw manure, to keep the ground moist until the seedlings are up, when the covering is to be lifted. Thin the seedlings to 3 or 4 inches apart—keep well watered and in about 6 weeks the young plants can be removed to their permanent flowering quarters, where they must be again covered with salt hay to a depth of about 3 inches after freezing weather sets in. Pansies wintered in this way make sturdy clumps and flower early and freely the succeeding spring. Another way to winter over autumn-grown seedlings is to transplant them 3 to 4 inches apart according to their size into coldframes (treat as directed for coldframes on page 15), and transplant to flowering quarters as early in the spring as possible.

**PANSIES FROM SPRING-SOWN SEED.** Any time from the 1st of February to April, the earlier the better, the seeds may be sown in shallow boxes or seed pans of fine rich soil and placed in a greenhouse, hotbed or window, where the temperature averages 65°. Sow thinly—cover about one-quarter of an inch deep, then press the surface with a board—do not allow the surface to dry out, and in about three weeks the seedlings should be large enough to be transplanted an inch or two apart into similar boxes or pans of fresh soil. If these transplanted seedlings get too crowded before they can be set in open ground, a third transplanting may have to be done to keep the plants from getting lanky and spindly. Keep them as hardy as possible by giving air on favorable occasions. Another way to raise spring-sown pansies is to sow the seed thinly in a coldframe about March, and transplant when the weather is favorable and the plants are of sufficient size.

# How to Grow Sweet Peas.

Sweet Peas as ordinarily grown in northern climates are simply sown early in the spring in rows 5 feet apart, the seeds 2 to 3 inches apart and covered 1 to 2 inches with soil, the plants being supported by brush or trellis. Even under this indifferent cultural treatment, Sweet Peas will give satisfaction when soil and season are not uncongenial. But to grow the best and largest flowers and lengthen the season of bloom, special treatment must be given. In the first place, we must understand that the Sweet Pea plant, if given the opportunity, will send its roots down 2 feet or more in their search for food and equable, cool, moist (not wet) soil. Established plants under such conditions are not so susceptible to drouth and heat as plants permitted to only root near the surface. Another important essential is earliness in sowing. Get the seed in the ground as soon as the frost is out, the object being to have as long a spell of cool weather as possible after sowing to deter top growth and throw the strength into root action, which goes on just the same. For this reason Sweet Pea seeds are sown in Southern States, California, etc., in the fall or early winter, according to climate. Remember that well and deeply rooted insures luxuriant plants, large flowers, and a prolonged blooming season. To attain this desideratum, soil preparation is very important. The soil should be made rich and mellow by digging it 2 feet deep and incorporating with it old, rotted and pulverized manure so there will be no lumps of manure left to burn the roots. In case a stiff subsoil lies nearer to the surface than 2 feet, then "trenching" should be resorted to, as described on page 5. Fall preparation gives the best results, especially if the ground is left rough to weather during the winter. In the spring before sowing the seeds, lime and bonedust at the rate of  $\frac{1}{2}$  lb. of each to the square yard may be worked into the upper 6 inches of soil with good results. Sow the seeds—for reasons before explained—as early as possible in the spring, in rows 5 feet apart, seeds to be about 3 inches apart; and, if ground has been prepared as advised, then the plants are to stand not nearer than 6 inches apart. As a rule we grow Sweet Peas too crowded in America. Keep well cultivated and hoe a shallow furrow 6 inches from the row on both sides, to receive liberal applications of water during drouth. These same furrows may also be utilized in applying stimulants if needed, such as weak manure water (prepared as directed on page 23) or nitrate of soda, 1 oz. dissolved to bucket of water and applied to 15 feet of row once a fortnight. Cut the flowers freely, for, if many are allowed to form seedpods, the plants soon go out of bloom.

**SUPPORTING SWEET PEA VINES.** Sweet Peas are most natural, graceful and picturesque when twining to brush supports. Thrust the butts firmly in the ground and incline the brush so they cross one another "xx" style; then tie occasionally where they cross to add strength in case of wind.

**Single Wire-Netting Support.** Strong stakes driven 2 feet in the ground and about 10 feet apart with the netting tacked on, is all there is to putting up single-row netting. The height depends on how tall Sweet Peas grow with you. The average is probably 5 to 6 feet, for which netting 4 feet wide will be required—the bottom being 1 foot above the ground to permit of cultivation between plants.

**Netting Both Sides of the Row.** In situations exposed to strong winds—liable to blow the vines off single-row netting, it is advisable to net both sides of the row—but as it is difficult to pick the flowers when netted to the full height it is therefore best to run netting 18 inches wide—the bottom one foot from the ground; then as the vines attain sufficient height, run a strand of wire 6 inches above the top of the netting, adding other strands same distance apart as needed. The opposite stakes should be 1 foot apart or each 6 inches from the plants.

## HOW THE ENGLISH GROW THEIR BIG EXHIBITION SWEET PEAS.

The seeds are sown late in January or early in February in pots, one seed to a 3-inch pot. These are then plunged in a coldframe or in a cold greenhouse, the temperature being just warm enough to keep out frost, air being given on all favorable occasions. As the pots fill with roots the plants are shifted into larger pots and so on until ready to set out in the open ground in April, in soil prepared **three feet deep** the fall before. The plants are knocked out of the pots, disturbing the ball of earth and roots as little as possible, and set out **one foot apart** in the row. The details of soil preparation (excepting depth), general culture and treatment are practically the same as we have advised for American culture. A week or ten days before the exhibition most of the flowers are removed, leaving a few of the longest-stemmed developing buds carrying 3 and 4 buds to a stem.

## Suggestions Regarding Preparing, Packing, and Staging Exhibition Sweet Peas

To produce the finest Sweet Pea flowers for exhibition the plants selected for their production should have liberal treatment. Everything should be done to have them in good vigorous condition. In dry, hot weather do not allow them to flag for lack of moisture, water so thoroughly that the roots way down two feet or more in depth may get their share, then afterwards about once a week apply manure and soot water prepared as described on page 23.

All flowers should be removed before fully developed, so the plants may reserve their whole strength for the exhibition flowers. It requires—under congenial conditions—about two weeks for a flower stem one inch long, to attain maximum length and develop its flowers perfectly, but it will be safer to allow three weeks' time. Flowers too far advanced should be removed before the top flower is fully expanded. Varieties liable to burn or scald in the hot sun, particularly the orange, salmon and scarlet sorts should be shaded with coarse cheese cloth placed well above the plants. The stage of development at which exhibition flowers are to be cut depends upon the time to elapse between cutting and exhibiting. If they can be staged in a few hours, fairly matured flowers are best for they are then in their prime of substance, length and strength of stem. The top flower nearly expanded is a good indication to go by, but if the flowers are to be packed for a lengthy journey they must be cut correspondingly younger. When exhibited near home the flowers should be cut the morning of the exhibition but when they are to be shipped some distance consideration must be given as to when to cut, prepare and pack the flowers; when these factors are properly attended to Sweet Pea flowers will carry for twenty-four hours or more and open up in good condition. The secret of success is in having the flowers dry on the outside so they will not spot, sweat nor the petals cling together, but open out full when vased, and in having the stems full of moisture to sustain the substance of the flowers. This desideratum is best accomplished by cutting when the dew is off, then place the stems loosely in vases or pots of water in a dry light shed or room with the windows open where the circulating air will dissipate any moisture remaining on the flowers. Do not place them in the sun nor in the dark, for in the latter event the flowers of some varieties might partially close and not fully expand afterwards. The flowers should remain under these conditions for about two hours, and it is sometimes astonishing how much they will develop. In cutting, the full length of the stem should be taken—but none of the vine—for length of stem counts 25 points when judged.

**PACKING SWEET PEA FLOWERS FOR SHIPMENT.** After the flowers have been prepared and treated as above explained, each variety is to be bunched carefully, with name label attached, and tied lightly to avoid bruising or breaking the flowers or stems, then if they are to travel some distance wrap the stem end of each bunch in damp, not wet, cotton, moss or newspaper to exclude drying air, inclosing this damp material in oil paper or other waterproof material to keep the moisture from flowers that in packing might come in contact. Then if the weather is damp or sultry, wrap each bunch in tissue paper which will absorb any moisture remaining on the flowers, but if the weather is dry and hot then use waxed or oiled paper instead, which will prevent excessive evaporation. Lay the bunches flat, in a box or hamper five or six inches in depth, and of suitable size, only one layer deep, one bunch below and between two other bunches sufficiently close and tight to prevent them from moving about and being-damaged in transit. A little Sweet Pea foliage with tendrils should be enclosed in the box. It is advisable to send a few more flowers of each variety than required so a selection may be made from those arriving in the best condition—but be careful not to put a greater number of stems in a vase than the schedule calls for.

**STAGING.** When the exhibitor stages his own flowers, unless he be accustomed to it we suggest that he experiment first at home by vasing flowers of a similar lot of the varieties to be shown and arrange the color scheme, noting same on paper so there may be no delay in properly placing the flowers as unpacked in the Exhibition Hall. The grouping should be nicely balanced with light and dark colors distributed so the light colored varieties will be brought out in contrast against the darker sorts. Do not jam the flowers in the vases in a compact mass but arrange loose and spreading, so that each stem of flowers can be individualized. A few sprays of Sweet Pea vine with foliage and tendrils arranged among the flowers often improves the effect if not overdone.

# Aid in Selecting Flower Seeds

For DIFFERENT PURPOSES and SITUATIONS.

ANNUALS attain full growth from seed, flower and die in one year.

BIENNIALS grow from seed one year, bloom and die the next, though some varieties bloom the first season when sown early.

PERENNIALS last for several years, blooming annually after the first season, though some varieties will bloom the first season if sown early.

*H. P. indicates hardy perennials. T. P. tender perennials.*

## FLOWERING GARDEN ANNUALS and OTHER PLANTS

that attain perfection and flower the 1st season from seed.

Sorts marked \* are best for massing in beds.

Abronia	Chrysanthemums *	Kochia	Pansies *
African Daisy *	(Annual Var.)	Lantana	Pennisetum
Ageratum *	Clarkia	Larkspur	Pentstemon
Alyssum, Sweet *	Cleome	Lavatera	Petunia *
Antirrhinum *	Convolvulus Minor	Linum	Phlox D. *
Arctotis	Cosmos	Lobelia *	Poppy *
Arnebia	Dahlia	Lupinus	Portulaca *
Asters *	Datura	Lychnis Haageana	Rhodanthe
Balsam	Dianthus *	Marigold *	Ricinus
Bartonia	Dolichos, Bush	Marvel of Peru	Rudbeckia
Begonia, Fibrous *	Eschscholtzia *	Matricaria	Salpiglossis
Brachycome	Euphorbia Var.	Mathiola	Salvia *
Browallia	Gaillardia	Mesembryanthemum	Scabiosa
Cacalia	Geranium	Mignonette	Schizanthus
Calendula *	Glaucium	Mimosa	Stocks *
Calliopsis *	Globe Amaranth	Mimulus	Sunflower
Canna *	Godetia	Myosotis *	Sweet Peas
Candytuft *	Gypsophila Muralis	Nasturtium *	Sweet Sultan
Carnation,	Helichrysum	Tom Thumb	Verbena *
Marguerite	Heliotrope	Nemesia	Vinca rosea
Celosia *	Hibiscus Africanus	Nicotiana*	Virginian Stock
Cockscomb *	Hollyhock*(Annu'l)	Nigella	Wallflower (Annual)
Centaurea (Annual)	Ice Plant	Oenothera	Zea
	Impatiens	Oxalis	Zinnia *

## FLOWERING HARDY PERENNIALS.

for permanent beds, borders and masses, flowering the 2d year from seed and thereafter.

Achillea	Coreopsis	Hyacinthus, Cand.	Polyanthus
Alyssum, Hardy	Cowslip	Incarvillea	Poppy, Hardy
Anchusa	Delphinium	Lavender	Primula, Hardy Sorts
Anemone	Dianthus, Hardy	Lobelia, Hardy Sorts	Pyrethrum Hybrids
Aquilegia	Digitalis	Lupinus Arboreus	Romneya
Asperula	Edelweiss	Lychnis Chalcodon.	Rose, Hardy Sorts
Asters, Hardy Sorts	Gazania	Myosotis	Scabiosa, Hardy
Bellis	Gaillardia, Hardy	Pæonia	Stokesia
Candytuft, Hardy	Glaucium	Pansies	Sweet Rocket
Campanula	Gypsophila panic.	Pentstemon	Sweet William
Canterbury Bells	Helenium	Phlox, Hardy	Tritoma
Carnation, Hardy	Heuchera	Physostegia	Valerian
Chrysanthemum,	Hibiscus, Hardy Var.	Pinks, Hardy	Violets, Single
Hardy Sorts	Hollyhock	Platycodon	Wallflower

## EDGING PLANTS from SEED, for Bordering Walks and Beds.

All are Annuals excepting H. P. are Hardy Perennials.

Ageratum, TomTh'bs	Candytuft, H. sorts, H.P.	Myosotis, H. P.	Pyrethrum Aureum
Alyssum, Sweet	Cosmos, Dwarf Yel.	Nasturtium, Liliput	Sw. William, H.P.
" H. Sorts, H.P.	Globe Amaranth,	Nigella, Tom Thumb	Sweet Pea, Cupid
Asters, Miniature	Nana Compacta	Pennisetum	Zinnia, Liliput
Begonia Vernon	Lobelia Comp. Vars.	Petunia Compacta	
Bellis, H. P.	Marigold, Brownie	Phlox, Nana Com-	
Candytuft, Dwarf	" Liliput	pacta	

CLIMBING VINES FROM SEED.

Annuals.

⊙ Low-growing for fences, low trellis.

Balloon Vine	Hyacinth Bean
Butterfly Runner	Ipomœa
Bryonopsis ⊙	Maurandia ⊙
Calampelis ⊙	Mina
Canary-Bird Vine	Momordica
Cobœa	Moon Flower Vine
Coccinea ⊙	Morning Glories
Convolvulus Major	Nasturtiums
Cypress Vine ⊙	Solanum Seaf.
Dolichos	Sweet Peas ⊙
Gourds	Thunbergia ⊙
Hop, Japanese	Tropœolum

Hardy Perennials.

△Cling to walls, trees, etc. by stem rootlets.

Adlumia	Hop, Common
Ampelopsis V. △	Honeysuckle
Aristolochia	Ivy, English △
Asparagus Vertic.	" Kenilworth △
Bignonia	Kudzu Vine
Celastrus	Lathyrus latifolius
Centrosema	Polygonum
Clematis	Wistaria

Greenhouse Climbers.

Asparagus plum. nanus	Smilax
Maurandia	Solanum
Passion Flower	Swainsonia

ORNAMENTAL FOLIAGE PLANTS GROWN from SEED.

A., Annuals; H. P., Hardy Perennials; T. P., Tender Perennials.

Amaranthus, A.	Cineraria Marit., T. P.	Kochia, A.	Perilla, A.
Canna, T. P.	Coleus, T. P.	Marvel of Peru, Var.	Pyrethrum Aure, T. P.
Centaurea candida,	Euphorbia Var., A.	Fol., A.	Ricinus, A.
T. P.	Grevillea, T. P.	Musa, T. P.	Zea, A.
" Gymnoc, T. P.			

PLANTS FROM SEED succeeding in Partial Shade.

Anemone	Canterbury Bells	Hardy Primrose	Pansy
Antirrhinum	Coreopsis (Hardy)	Linum	Polyanthus
Aquilegia	Cowslip	Matricaria	Poppies (Hardy)
Auricula	Delphinium	Mimulus	Schizanthus
Begonia, Tuberous	Digitalis	Myosotis	Torenia
Bellis	Ferns	Onothera	Violet

PLANTS SUITABLE FOR POTS, that may be grow from Seeds.

Abutilon	Chrysan'mums, Paris Daisies	Impatiens	Polyanthus
Acacia	Cineraria	Lantana	Primrose
Ageratum	Coleus	Mignonette	Rehmannia
Asparagus Spreng.	Cyclamen	Mimosa	Rhodanthe
Asters, Dwarf Sorts	Dracena	Mimulus	Rose
Auricula	Ferns	Musa	Schizanthus
Begonia	Fuchsia	Myosotis	Smilax
Browallia	Geranium	Nasturtium, T. Th'b	Stevia
Calceolaria	Gloxinia	Nemesia	Stocks
Carnation	Grevillea	Pelargonium	Swainsonia
Chrysanthemum	Heliotrope	Petunia	Torenia

FRAGRANT FLOWERS FROM SEED.

Those marked H. P. are Hardy Perennials.

Abronia	Cyclamen	Nicotiana Affinis	Sweet Sultan
Alyssum	Dianthus (Hardy)	Pinks, H. P.	Sweet William, H. P.
Asperula, H. P.	Geranium (Apple)	Polyanthus	Verbena, Lemon
Auricula	Heliotrope	Rose	Violet, H. P.
Carnations	Lavender, H. P.	Scabiosa	Wallflower, H. P.
Clematis Flam., H. P.	Mathiola	Stock	
" Panic. H. P.	Mignonette	Sweet Pea	
Cleome	Mimulus Moschatus	Sweet Rocket, H. P.	

LONG-STEMMED FLOWERS from Seed, Suitable for Cutting.

Aquilegia	Chrysanthemums :	Gladiolus	Salpiglossis
Arctotis	Maximum, Japan-	Gypsophila Paniculata	Scabiosa
Asters	ese and Chinese	Larkspur Branching	Stevia
Calliopsis	Coreopsis	Lobelia (Hardy sorts)	Stocks
Carnations	Cosmos	Marigolds	Sunflowers (Cut and
Centaurea Cyanus	Dahlias	Matricaria	Come Again)
" Sweet Sultan	Delphinium (Hardy)	Mignonette	Sweet Peas
	Dianthus (Hardy sorts)	Pentstemon	Sweet Sultan
	Gaillardias	Poppies	Zinnias

Drooping Plants for Vases, Hanging Baskets, Veranda Boxes, etc.

Alyssum	Nasturtium (Trailing)
Asparagus Sprengeri	Oxalis
Calendula	Petunia
Lobelia Gracilis	Smilax
Maurandia	Torenia

Everlastings for Winter Bouquets.

Acroelinium	Helichrysum
Edelweiss	Honesty
Globe Amaranth	Ornamental Grasses
Gypsophila Paniculata	Rhodanthe

# Flowering Bulbs.

## CULTURE in GARDEN, POTS and NATURALIZED.

Bulbous flowering plants are a unique class of the vegetable kingdom, the bulb being a storehouse of reserve food and energy within which is formed after flowering and before maturing a new plant, in embryo—flowers, leaves and stems complete, simply awaiting development. During their dormant period bulbs may be taken out of the ground and stored for future planting, their places being utilized by other plants.

The proper time to plant hardy spring-flowering bulbs, such as Tulips, Hyacinths, Narcissus, Crocus, etc., in the garden is about 6 weeks before freezing weather sets in; this gives them time to root well—while the cool nights deter top growth so the latter is not so liable to be injured by freezing.

**PREPARATION OF BULB BEDS, PLANTING AND TREATMENT.** As a rule, well rotted manure (be sure it is well rotted, not fresh and heating) should be liberally applied and dug in the ground deeply; it must be where the long, feeding roots can get at it and yet not touch the bulbs, nor be too near their base. This is easily accomplished by removing a few inches of the top soil first. If it is impracticable to do this, then it is not advisable to use manure at all, for the bulbs are liable to come in contact with it and become diseased. Bone meal alone is then the safest fertilizer to use. Liberal applications of manure water when the bulbs are in bud often produces magnificent results.

**DEPTH TO PLANT BULBS.** It is a common fault to plant bulbs too near the surface. Some kinds, notably the Californian lilies *Humboldtii*, *Washingtonianum*, etc., do best when ten to twelve inches deep; Hyacinths, Tulips, Narcissus, and similar large bulbs from four to six inches deep—smaller bulbs somewhat shallower. Hardy bulbs root during the fall and early winter, and if planted too near the surface, the freezing, thawing and heaving of the upper crust of the soil in mild winters often causes the bulbs to break from their roots and in consequence only inferior flowers are produced.

**MULCHING.** When good cold weather has set in and a light crust has been frozen on the soil, then cover the bed with leaves, straw, marsh hay or reeds to a depth of from four to six inches; this protects not only from severe freezing but from equally injurious unseasonable thaws. Do not put the covering on too early for it might warm the soil so the leaves and flowers in the bulbs would commence to grow and afterwards be injured from freezing. Remove the covering in the spring gradually.

**NATURALIZING BULBS: FOR PARKS, GROVES, MEADOWS** and wild outlying grounds beyond the closely clipped lawn, a very happy style of "naturalizing" bulbous plants is coming much in vogue. Such bulbs should be used as can be planted in quantity, twenty-five to a hundred or more of a kind in a patch, and only sorts should be used as are hardy and will flower and thrive and increase with neglect; fortunately in bulbous plants there are many that succeed even better in such rough places than in the prim garden, among them we will mention hardy Anemones, Crocus, *Chionodoxas*, *Camassias*, *Convallarias*, *Dicentras*, *Erythroniums*, *Funkias*, *Liliums*, *Narcissus*, *Scillas*, *Snowdrops*, *Trilliums*, and some of the late-flowering Tulips. The bulbs may be dibbled in when the ground is moist and soft during the fall rains, but it is better to cut and turn back the sod here and there, place the bulbs under and press the sod back again.

**SUMMER AND AUTUMN FLOWERING GARDEN BULBS FOR SPRING PLANTING.** This class, not hardy, include some of our showiest garden flowers, and are almost indispensable. They are of the easiest possible culture; planted in the spring after danger from frost is over, in a sunny position in good, rich, loamy soil, they will flower with great certainty the same season. After flowering and the foliage has ripened, they are to be taken up and stored for the winter in a dry cool place excepting those marked **F** must be kept in a semi-dormant condition in a coldframe or greenhouse during the winter. Among the more important species of this class of bulbs are the under-mentioned: *Alstromeria* (F), *Amorphophallus*, *Anomatheca* (F), *Antholyza* (F), *Tuberous Begonia*, *Bessera*, *Colocasia* (*Caladium*), *Cooperia*, *Crinum*, *Cypella*, *Gladiolus*, *Galtonia* (*Hyacinthus Candicans*), *Boussingaultia* (*Maderia Vine*), *Montbretia*, *Border Oxalis*, *Ornithogalum* (F), *Pancratium*, *Richardia* (*Callas*), *Schizostylis* (F), *Sprekelia*, *Tigridia*, *Tuberose*, *Watsonia*, *Zephyranthes*.

**INSTRUCTIONS FOR THE WINTER FLOWERING OF HARDY AND HALF-HARDY BULBS.** When hardy bulbs are to be grown in pots for winter blooming in the house or conservatory, the bulbs should be potted as soon as they are procurable, between August and November.

The soil used should be rich loam; no **fresh** manure can be used, though if thoroughly rotted, some may be pulverized and worked through, but it is safer to use in place pure bone meal, one part to fifty of soil. If the soil is stiff and heavy, mix it with sand and leaf-mold or peat. The size of pots required depends upon the kinds of bulbs—a five-inch pot is best for a first-sized named Hyacinth, large bulbing Narcissus, particularly the Polyanthus type require the same size pot as do similar large bulbs. Tulips, small Narcissus and bulbs of a similar size, while they can go individually in a four-inch pot, yet it is better to put three or more bulbs of one variety in a larger pot, as the soil retains a more even temperature and moisture; for this reason, some people prefer earthen bulb pans which come in various sizes from eight to eighteen inches in diameter. In potting, place a little broken pottery or lumps of charcoal in the bottom for drainage, then fill the pot with soil and shake it down, but do not pack it, neither must the bulb be pressed or screwed into the soil, which packs the soil under it so when the roots start they often raise the bulb out of the pot.

The tops of the bulbs (excepting Lilies) are kept about even with the top of the soil. Do not water them unless the soil is very dry, for bulbs in a dormant condition resent an excess of moisture. After the bulbs are potted, they should then be placed in a coldframe or cold pit to root. Cover the pots, boxes or pans with four inches of sand, ashes, rotted leaves, tanbark or similar substance, and do not put the sashes on until freezing weather, and even then remove the sash on pleasant days. Where no coldframes or pits are available, a trench is dug a foot deep in the garden, three inches of coal ashes is first placed in the trench to allow drainage and keep the worms out, the pots are then placed on the ashes, the earth is filled in, working it among the pots, filling up the trench, rounding over. No further attention is then required; everything is congenial to perfect root development, while it is cool enough above to check top growth. When the weather gets cold enough to freeze a crust on the soil, then an additional covering of about four inches of rough stable manure, leaves or straw is put over. Some early bulbs such as Roman Hyacinths, Paper White Narcissus, Duc Van Thol Tulips, etc., will root sufficiently in five or six weeks to be taken up for first flowers, which should be out by Christmas or earlier, but it is safer to allow all bulbs not less than eight weeks for rooting. Every two weeks after the first removal of pots, or as needed, further relays of rooted bulbs may be taken out for a successional display of bloom.

When the pots of hardy bulbs have been taken up, place them in a cool greenhouse or cool, light storeroom where the temperature is not over fifty degrees, which temperature will allow the flower stems and foliage to grow, and at the same time prevent the opening of the flowers until the stems have attained their proper height, after which the pots may be taken to a warm sunny window or wherever they are wanted to flower. Bulbs treated in this manner will produce perfect spikes of perfect flowers. A good rule to keep in mind in flowering **hardy** bulbs is, 40 degrees for root development, then 50 degrees for foliage and stems, then 60 degrees for best flowers, 70 degrees for quick development.

**FLOWERING BULBS IN GLASSES, BOWLS, UNIQUE POTS, ETC.**—There are several curious and pretty methods of flowering certain bulbs besides in ordinary pots and pans. One of the most successful and interesting are Hyacinth bulbs in glasses of water; use early-flowering single varieties only. Special "Hyacinth Glasses" are procurable for the purpose. These are simply filled with fresh pure water; a lump of charcoal thrown in absorbs impurities, but is not absolutely necessary. The bulb sets in a cup-shaped receptacle on top of the glass. In filling, the water should not quite touch the bottom of the bulb. Place in cool, dark, airy place until the roots have reached the bottom of the glass, which should be in about six weeks' time. Do not place them in a close, warm closet, for they must have fresh air. As the water evaporates fill up the glasses and change the water entirely when needed to keep it sweet and clear. After rooting, place the glasses in a light storeroom where the temperature averages about 50 degrees, until the stems and foliage have developed, then remove to a warm sunny window for flowers to open.

The so-called "Chinese Sacred Lily," a variety of Polyanthus Narcissus, grows and flowers luxuriantly in bowls of water, provided they are not placed in a dry furnace-heated room which will cause the buds to blast before opening. A kitchen window where the air is moist often is the result of producing finer flowers than when a window is utilized in a parlor or living-room where the air is dry.

## HOW TO GROW Chrysanthemums from Plants.

**TREATMENT OF PLANTS WHEN RECEIVED.** If the young plants of Chrysanthemums are received in the winter or spring before the weather is warm enough to plant them in the open ground, they should be planted in small flower pots, say 3 or 4 inches in width, or in shallow boxes, such as cigar boxes, in any good soil such as is used for any ordinary house plant. It will be necessary to shift the Chrysanthemums into larger pots or boxes at least once during the season, otherwise they would not have sufficient soil in the smaller pot or box to grow the plants in the best manner.

**PLANTING TIME.** The time for setting the plants outdoors is best told by saying that they should be set out about the time corn and tomatoes are planted, which, in the vicinity of New York, is about the middle of May; of course, if you are farther north, it must be later; if farther south, earlier.

**CULTURAL NOTES.** After planting give them one good watering, which will usually be sufficient for the first six or eight days; after that, if the surface of the soil appears dry, they may again be watered, but very lightly, as they will not start to grow much for three or four weeks after planting. As soon as they begin to grow freely they will require water oftener and in greater quantity. As the Chrysanthemum is quite a hardy plant, it may be kept in a cool room or greenhouse where the temperature runs from 50 to 60 degrees. If desired to be grown for indoor decoration, the plants should be placed in any good, rich soil in flower pots of not less than six inches in diameter and depth; or, if flower pots are not convenient, boxes of about the same capacity will do equally well, and placed outdoors in a good, sunny exposure. It is rather the best plan for amateurs to sink the pot or box containing the plant, so as to be level with the surface; this keeps it cool and prevents it getting too dry in hot weather. The pots or boxes should be moved every two or three weeks, so as to prevent the roots getting through into the ground, as they must all be kept within the limits of the pot or box, otherwise they would wilt when taken up in the fall.

**PINCHING BACK SHOOTS.** Soon after the Chrysanthemums are set in the open ground they will grow rapidly. As soon as the shoots attain a height of nine or ten inches, they should be "pinched back," as it is called, that is, with the finger and thumb pinch out an inch or so of the center of the shoot, that at once stops the upward spindling growth and causes the shoots to branch out from below. If fine, bushy plants are desired, this "pinching back" must be done every two or three weeks up to the middle of August, **but not later**; the plants will then have attained a growth of 1½ to 2 feet in width and height. Although when the pots or boxes have been sunk to the level of the surface they are not likely to require much water, yet, in long continued dry spells, it will be necessary to give them a good soaking once a week, but that will usually be sufficient. By October, the plants, if treated as already directed, will have attained a height and width of two or three feet, having from fifteen to thirty shoots on each plant.

**DISBUDDING.** On each shoot will be found, about the first of October, a cluster of flower buds. If the finest flowers are desired, all the buds except one—the strongest—should be rubbed off. On the next page we give sketches of the two great classes of buds formed by Chrysanthemums known as "Crowns" and "Terminals." Under the system of culture herein described nothing but "terminals" will appear. Should the grower get a cutting in February, however, and grow it along to a single stem or to three stems "crown" buds would appear. As shown in the sketch the "crown" bud comes alone the "terminal" always accompanied by others; the latter is the safer bud to leave always. Pinch out where shown on dotted lines. By the middle of October they should be placed under cover in some plant room or greenhouse, where the temperature ranges from say 50 to 70 degrees, and for five or six weeks you will be repaid for your labor by the gorgeous blooms suitable for exhibition purposes. Treated in this way, many kinds give flowers eight inches in diameter.

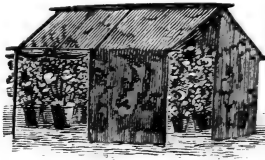


## DISBUDDING CHRYSANTHEMUMS.

See directions on preceding page.



GROWN BUD



### PROTECTIVE STRUCTURE OF COTTON CLOTH.

Described below.



TERMINAL BUD

**SOUTHERN CULTURE.** The directions for culture given above refer to plants that are to be grown in boxes or pots for northern indoor culture, but where it is mild enough for Chrysanthemums to flower in the **open garden**, they had better be taken from the pots and planted at once in the open border (as soon as the ground is warm enough in spring); but treated by "pinching" and "disbudding" exactly as already described, if fine flowers are an object; if not, they may be left to nature and still make a grand display, if the different varieties are used. In nearly all sections south of Baltimore the Chrysanthemums will perfect their flowers in the open garden and will stand the winter without protection; but very few of the finer kinds will perfect their flowers or prove hardy north of Baltimore so when grown in pots or boxes the best way to save the plants is, after they are done blooming, to place them in a cool cellar where, if kept dry, they will keep safely until they can be again grown the next year.

**PROTECTIVE STRUCTURE.** A cheap and simple plan now extensively used to protect Chrysanthemums from the slight frosts that we usually have in the North—which in different sections come from the 20th of October to the 20th of November—is to make a tentlike framework of size desired and cover it with "protecting cloth," a cotton cloth treated with a preparation to prevent mildewing and rotting. This tent may be (if 10 feet in width) 4 feet high at the front and 7 feet high at the apex, with a walk in the center, the plants to be on either side, either in pots, boxes or growing in the ground. This cloth (1 yard in width) can be bought of the best heavy grade at 14 cents per yard, and a lighter grade at 10 cents per yard in pieces of about 50 yards in length.

**CHRYSANTHEMUM CLASSES.** There are several classes of Chrysanthemums. The "Pomponé" or "Button" varieties are the only reliably hardy sorts in the Northern States. The "Anemone" is a unique class with a row of petals like a daisy around a large center. There are also early, medium, late, Chinese and Japanese exhibition, incurved, recurved, etc.

**PROPAGATION.** It may be stated that, if Chrysanthemums are wanted to be propagated in summer, slips taken any time from May to August will root freely and produce fine flowering plants by November of the same year.

**INSECTS.** The most common insect pest is the "black fly" which fastens on the young shoots. This is easily kept in check by a liberal use of tobacco dust put on the foliage and kept on until the insects disappear. Green fly treat the same as directed for black fly. A green worm makes its appearance in the fall and will eat the buds. Hand picking and Paris green are the best remedies.

**MILDEW.** Should this appear, evident by a whitish deposit on the leaves and curling of same, dust the affected parts with flowers of sulphur.

**RUST.** A fungoid disease which appears on the under side of the foliage. Badly affected leaves and plants should be destroyed. Syringe plants twice or three times a week with a solution of sulphide of potassium, procurable at any drug store,  $\frac{1}{2}$  oz. dissolved in a gallon of water until eradicated.

# Dahlia Culture

**SOIL AND PREPARATION.** Dahlias will succeed in any soil which will grow corn or potatoes; but where a choice can be made it is best to select one rather light, well drained and moderately rich. More flowers and better ones will be produced in such a soil than a heavy one with clay bottom; the latter in fact is the most unsuitable for them. Should only such a soil be available let the subsoil be broken up, repeat every two years at least, and add coarse sand or coal ashes to the top soil to lighten it. Dig or plow to the depth of one foot and follow with rake or harrow to break up and smooth out the soil, a very important cultural item for all crops. Before digging or plowing put on well rotted barnyard manure two to three inches deep and thoroughly incorporate it with the soil. If that is not available use Henderson's Garden Fertilizer, which can be put in the place where the Dahlia is to be planted, mixing it thoroughly with the soil, a good handful being sufficient for each. Never dig or plow when the soil is wet.

**SITUATION.** This is a matter of prime importance. Dahlias should only be planted in an open situation, away from large trees which would shade them and rob the soil of its fertility, away from the shade of buildings also. While Dahlias will grow and give some blooms under these conditions the results in the open ground, away from shade, are far better.

**FIELD GROWN ROOTS.** We recommend the field grown roots in preference to green plants or pot roots, as being much better for general planting and more certain to produce desirable results. Occasionally new varieties can only be obtained in growing plants so that there is no choice left for those who want them.

**PLANTING DISTANCE.** The Pomponé varieties may be planted two to two and one-half feet apart but all the others should be planted three to four feet apart; if room is available put them at the greater distances.

**PLANTING TIME.** Around New York Dahlias can be planted about the middle of April in favorable seasons and planting may be continued up to the middle of June or even later. Local conditions of soil and weather, will determine the exact planting time. As a general rule early planting is advisable.

**PLANTING METHOD.** The soil being prepared as directed open a space wide enough to receive the root spread out flat, and deep enough to have the crown six inches below the surface. Replace the soil, firm moderately, and the operation is complete.

**STAKING.** All things considered it is better to use stakes to support Dahlias and the best time to place them is when the roots are being planted as it is easy to see then where to put the stake. In this connection we would suggest only the use of a neat stake such as we offer for the purpose, green with white tops; the gain in appearance compensates for the difference in cost over many of the home-made stakes used. In tying the stems do not crowd them as it is of the greatest importance to have them separated so that air and sunlight can find their way freely into the centre of the plant. It may be necessary when the plants are very bushy to put lighter stakes, such as the cane stakes we offer, connecting the upright stakes, tying them securely to each, so as to form a sort of lattice to which the outer branches can be fastened.

Some growers get along without staking the plants by this method:—When the shoot has made two sets of leaves the tip is pinched out, leaving the two sets of leaves but severing the main stem. This causes the development of the branches from the axils of the leaves, making a plant of more bushy habit which ordinarily is self-supporting. This method is not always effective as the plants frequently break in wind storms and even with the weight of bloom they usually have an unkempt appearance; besides the branches droop and the flowers are turned downward so that the plant is not so ornamental nor are the flowers as good. The method just described will suffice for Pomponé varieties; but for all others we strongly advise staking.

**TRAINING PLANTS.** This is part of the foregoing operation but we make a separate paragraph of it because of its importance. The average root we send out will make several shoots. Allow them to grow until they make the first set of leaves, by that time the strongest can be selected and the others cut away below the surface. Sometimes two shoots may be allowed to grow but never more; as a rule one shoot is sufficient. Tie the shoot to the stake when about a foot high and do not neglect tying as the plant develops for this is very important.

**PRUNING AND DISBUDDING.** Some plants will possibly require pruning out small side branches and superfluous foliage when they are too bushy. Never hesitate to do this as it will help the main flowering stems and result in a better crop of flowers. Disbudding is also an essential feature of growing the best flowers and should be done. The buds are usually formed in groups of three, the central one should remain, and the two side ones pinched out as soon as they are large enough to be easily removed. The remaining bud as a consequence will make a much finer specimen.

**DAHLIA CULTURE.—Continued.**

**CULTIVATION.** This is the most important item in growing Dahlias. By cultivation we mean loosening the surface of the soil regularly; never allow it to become baked. Use the pronged hoe or wheel cultivator freely, going from four to six inches into the ground; close to the plant use a small hand cultivator to loosen the soil, so as to avoid injury to the stem and roots. Keep this up until the plants commence to bloom then only stir the soil to the depth of an inch or two and do it frequently as the surface must never be allowed to become hard if the crop of flowers is to be properly matured. It should be needless to say that no weeds should be allowed to grow at any time. No good cultivator will tolerate them an hour longer than is necessary to remove them.

**WATERING.** This is a subject which probably gives the average cultivator more concern than any other; rightly too as it is of prime importance. It is ever a mooted question when and how much water should be given not only to Dahlias but to all growing plants, whether in the fields or in pots. As a general rule Dahlias should not be watered. The soil being prepared as advised herein, and cultivation followed assiduously, enough moisture will be found in the soil by the roots of the plants. Watch them in seasons of protracted drought and if they show unmistakable signs of wanting water give it freely; enough to penetrate a foot below the surface. Superficial waterings are worse than useless for them, and for other crops as well. There is more damage done by such watering than if none was given. The principle of irrigation as carried out in our Western States is a safe guide. Give plenty of water when needed, then let that suffice until needed again when another thorough soaking should be given. As soon as the surface dries after watering stir it up and pulverize the soil; we repeat this as it is of the utmost importance.

**STIMULATING GROWTH.** The foregoing instructions being carried out no further work is necessary to successful culture. If, however, the grower wants the very best flowers and more of them they can be had by additional effort. Should the plants show signs of exhaustion and the flowers begin to get smaller, as happens frequently at midseason, scatter a handful of our garden fertilizer about each plant and work it into the soil with a small rake or hand cultivator. Give the plants a good watering afterwards to dissolve the fertilizer and thus make it quickly available to the plants.

**KEEPING FLOWERS FRESH.** For cut flowers Dahlias should be cut early in the morning as they are then fuller of sap than later in the day when evaporation is more rapid. Strip off a portion of the foliage from the bottom of the stem, six inches or so, and put the bare stems into water as hot as can be borne by the hand. Leave them there until it is cool, then put them into cold water, adding salt at the rate of about a half ounce per quart. Keep the flowers in as cool a place as possible and in the dark. Leave them in it for at least twelve hours before using. Those who have heretofore put them into use quickly after cutting will be delighted and surprised to find how much longer the flowers will last if treated as above described.

**INSECTS AND DISEASES.** Dahlias are remarkably free from these troubles. They will be occasionally attacked by mildew when their environment is not satisfactory and they have received a setback from some unfavorable condition. A treatment of Copper Solution will usually eradicate this trouble. Apply twice a week for two or three weeks or until the trouble disappears. If they are very badly affected and do not yield to treatment cut them down to within a foot or so of the ground and get an entirely new growth. Green Fly (Aphis) will sometimes attack the plants if their vitality is lowered from some cause. They are found on the under side of the foliage. A liberal use of tobacco dust, or spraying with tobacco water will soon destroy them. Keep at it while a vestige of them remains. The Aster bug, and Cucumber beetle will attack them also if prevalent in their vicinity, but usually in small numbers so that they can be controlled by hand picking. Watch for cut worms when the shoots are coming from the ground. A liberal sprinkling of air-slacked lime will discourage them. Even if they eat some of the shoots they will develop again from below the surface.

**STORING ROOTS.** When frost destroys the foliage the stems should be cut off close to the ground and the roots dug; remove the loose soil and expose them to the sun for a few hours to dry. Store them in a cellar where the temperature is about 55° F. They may be packed in boxes or barrels, but when there is room enough they had better be put on the floor in a pile. Watch them carefully during the winter and if they show signs of shriveling cover them completely with several thicknesses of heavy paper; or a number of newspapers; sprinkle the papers after they are put on the pile. If they show premature growths it is evident that there is too much moisture in the place and means should be taken to reduce it.

# Garden Culture of Gladiolus

Gladiolus for years have been popular garden plants, being easy to grow, thriving in almost any soil and climate, and are sure to produce their splendid flowers which are of unrivalled effectiveness in the garden. Moreover they are valued as cut flowers. The spikes of flowers cut when the lower flowers are opening will all develop and last a full week in water. The modern Gladiolus are triumphs of the hybridizer's art, new types and a legion of new varieties having been evolved that far surpass in size and form of flower—and varied coloring—the favorites so prized a few years ago. The plants are also stronger, and larger growers.

The Gladiolus is a bulbous plant, that is, it is perpetuated by a "bulb" (botanically a "corm") which forms underground between the plant and its roots like an Onion. After developing its roots, foliage and flowers it produces above it a new bulb to which it transfers its functions of storing up in embryo and holding in reserve the next year's roots, foliage and flowers. The new bulb after ripening off is taken up and stored away like a Potato—for the next season's planting, thus continuing the annual cycle of the parent Gladiolus bulb.

**GLADIOLUS BULBS** vary in shape and size according to the variety, some sorts form large flat bulbs 3 inches or more in diameter, others make smaller "fat" bulbs.

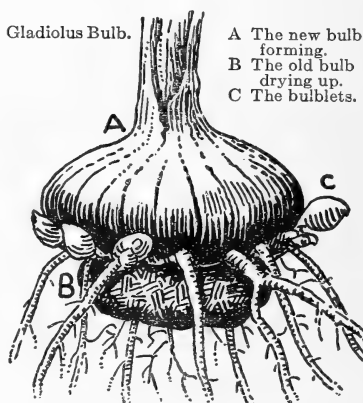
The culture of Gladiolus in the garden is very simple for they grow, thrive and bloom in all ordinarily good garden soils in any sunny, airy location; deep moist sandy loam is especially suitable, stiff clayey soil the least desirable but can be made more congenial by filling in the furrows with sandy loam or leaf mould—or both combined. A liberal application of well rotted manure, well pulverized, should be dug in and thoroughly incorporated with the soil. (Fresh stable manure must be avoided.) If the ground can be manured and dug the fall before, so much the better. Then a complete commercial fertilizer—such as "Henderson's Garden Fertilizer"—should also be added in the spring—strew it evenly over the surface at the rate of 10 pounds for 300 square feet and rake it after the ground is dug.

The bulbs may be planted (top up) as early in the spring as the ground is fit to work. Those planted in April will commence blooming in July, and by successive plantings every 2 weeks into the middle of the summer, a continuous succession of flowers may be enjoyed until frost. If the weather and ground is very dry, water liberally, particularly when the Gladiolus are developing their buds and flowers.

The bulbs should be planted from 2 to 4 inches deep; in light soils 4 inches deep, in heavy soils 2 inches, in medium heavy soils 3 inches deep. In groups or beds the bulbs should be planted 4 to 6 inches apart. A good way to secure a long season of bloom in a bed is to plant the bulbs 8 inches apart and then 2 weeks later fill in between with another lot of bulbs. If grown in rows the single rows should be 12 inches apart or in double rows 18 inches apart.

After the plants have ripened in the fall, the bulbs should be taken up for winter storage. To do this, loosen the earth with a digging fork or spade, lift the bulbs by their tops, lay them on the ground to ripen and dry off, after which the tops should be cut off close to the bulbs and the old roots and any of the old bulb that remains should be pulled off, then store away in trays placed in a cool dry place, but do not permit the bulbs to freeze.

Gladiolus bulblets—botanically "cormels"—are the little bulbs that are produced at the base of the parent bulb. These may be removed from the parent bulb and if kept in paper bags in a cool place where they will not dry out, these if planted in the spring in drills like peas—and afterwards treated like the flowering bulbs—will in 2 years form bulbs of flowering size, reproducing the flowers of the parent which seeds do not often do.



# Herbaceous Peonies

## PLANTING AND CULTIVATION

**PREPARATION OF SOIL FOR PEONIES, AND PLANTING.** The Peony is a gross feeder and the richest soil is none too good. They furnish the strongest stems and the largest and most desirable flowers when planted in situations where the soil retains a moderate degree of dampness. They should, however, be planted sufficiently far away from the border of streams or ponds to avoid flooding, or water standing upon the plants, and the soil should be so drained as to avoid any tendency of a swampy nature.

Where the finest flowers are desired, the soil for the Peony bed should be prepared as follows: An excavation the full size of the bed should be made two or three feet in depth, according to the character of the subsoil. If the subsoil is of a loamy nature, and of such texture as will retain moisture nicely, and admit of the growth of an abundant root system, the bed may be excavated to the depth of two feet, then a layer six inches in depth of thoroughly well-rotted manure should be spread on the bottom, and well spaded in. Cow manure is preferable. Do not use fresh manure. If the soil taken out is of a stiff, clayey nature it should be lightened by the addition of sand, leaf mold, and thoroughly well-rotted manure, using in bulk one-third of the sand, leaf mold, and manure to two-thirds, soil. This should be turned over two or three times, so that all of the ingredients will become evenly mixed and incorporated throughout the mass. Then fill up the excavation with this prepared soil, rounding it up at the centre, which should stand about eight inches above the level of the ground. In setting the roots, abundant room to allow them to develop into large clumps must be given. Each should be allotted a space equaling a circle three feet in diameter for its development. The crowns should be from two and one-half to three inches below the surface of the soil, and the earth well firmed around the roots. After the bed is planted it should be mulched with three or four inches of coarse, strawy manure, or that which contains a large proportion of forest leaves. In case the sub-soil at the bottom of the bed is of a very light, sandy nature, a dense, stiff clay, or coarse, rocky gravel, the excavation should be continued to three feet, this poor sub-soil discarded and the entire bed filled with the prepared soil.

**TIME FOR PLANTING PEONIES.** The best time for planting Peonies is in September. They will then make root growth before winter sets in and usually bloom the following spring; all planting should be finished not later than the 1st of November, although Peonies may be safely planted as late as the soil can be cultivated in the fall; but the late planted roots will lose a year in reaching full normal development. Peonies may be as successfully planted in the spring as in the fall, but, as before stated, it will take an additional year to develop into blooming plants.

**AFTER CULTIVATION.** There is no plant which will thrive, increasing in strength and beauty every year, with as little attention as the Peony. The third year after planting the ground will be entirely occupied and densely shaded by the foliage. Each fall, after the ground has become frozen, the tops of the Peonies should be cut off about three inches above the soil, and may be thrown back over the plants to serve as a protecting mulch during the winter. This should be augmented by a liberal dressing of coarse manure. In the spring this mulch should be shaken up, the coarse parts removed from the bed, and the remaining fine stuff spaded into the soil to the depth of five or six inches; the surface should be stirred around the crowns of the plants, care being taken not to injure or disturb the dormant crown buds.

During seasons of extreme drought in April or May, the growth of the Peony plants may be much improved and the crop of flowers largely augmented in quality and size by drenching the beds thoroughly with water once or twice a week. Under such conditions, sufficient water should be given to saturate the soil to a depth of twelve to fourteen inches.

**WHEN TO EXPECT CHARACTERISTIC FLOWERS.** There is one fact in connection with the planting and identification of Peonies that all purchasers of Peony roots should understand, that is, it takes fully three years from the time the "ordinary commercial root," i.e., the 3 to 5 crown cut division—is planted before the Peony becomes adequately established, and the crowns and root system sufficiently developed to enable it to produce normal flowers.

**DISBUDDING.** Most Peonies usually set three or more flower buds to each stem. These should all be pinched off excepting the terminal (largest bud) on each stem if finest flowers are wanted.

**WHEN TO CUT PEONY FLOWERS.** As cut flowers for vases and other floral decoration, long stemmed Peonies are unsurpassed. The flowers are most beautiful and lasting when cut from the plant before fully developed.

Half open flowers are best. These will gradually develop maximum size, when placed in water, and will last a week to 10 days if fresh water is given daily and a half-inch of the stems cut off every day to remove the callus and permit the flowers to absorb water.



# Garden Culture of the Rose.

In answer to thousands of inquiries, which we have each season from our customers, we give the following plain directions for the culture of the Rose. Our readers will of course understand that the most intelligent cultivation will sometimes prove a failure, owing to adverse seasons or unfavorable soil and location; but under ordinary conditions, if the instructions given below are followed out, success should follow:

**LOCATION AND PREPARATION OF THE SOIL.** To obtain the best results, Roses must be planted where they will have the full benefit of the sunlight; even in a slightly shaded place they never do so well. The soil should be dug to the depth of at least one foot, and thoroughly mixed with not less than two inches of well-rotted stable manure; in the absence of stable manure bonedust should be put on at the rate of 10 lbs. to every 100 square feet of surface; this should be well incorporated with the soil to the depth already named.

**THE BEST TIME TO PLANT** is usually about May 1st, in this section, the time varying, of course, according to season and location. In the extreme Southern States they may be planted from October to April; while in the extreme North planting may be delayed as late as middle of June.

**POT-GROWN PLANTS** that have had a partial rest during winter are by all odds the best to set out, as they are in condition to take root in the soil and grow at once after being planted. We are so firmly convinced of the superiority of this system of culture that we grow all our Roses in this way, and ascribe the uniform success obtained in planting our Roses (as compared with dormant stock lifted from the open ground) to this cause alone. In planting, it is only necessary to make a hole a little larger than the ball of earth on the plant, and after it is set in, **firm the soil well around the roots**, otherwise the dry air will shrivel them up and prevent their development. Never set the plants out should the ground be wet and soggy, but wait until it is fairly dry. After planting give the soil a thorough soaking, and should the earth around the plant be dry it should be thoroughly saturated with water a day or so **before planting**.

**DISTANCE TO PLANT.** The first season of planting, the Roses should be set about **one foot apart each way**; the next season, if desired, one-half of them may be moved and planted in another place, as the growth that they will make the second year would be sufficient to fill up the space.

**PRUNING.** The Hybrid Perpetual class of Roses should be pruned back to two or three buds or eyes each season; the pruning may be done at any period from the time the leaves drop in November until April. The Tea Roses, however, require but little pruning, simply thinning out the shoots where they have grown too thick.

**TREATMENT OF ROSES WHEN RECEIVED.** When Roses are received from the florist in mid-winter, they should be placed in boxes of any good, rich earth, or in flower pots of a size suitable for the roots, given a good watering, and placed in a temperature, if possible, not to exceed 50 degrees at night, although when the sun is shining through the day 10 or 20 degrees more will do no injury. The amount of water necessary must be determined by their condition—if growing vigorously, and the weather is bright, water may need to be applied each day; if they have not begun to grow freely, and the weather is dull and moist, they may not require water more than once or twice a week. If there is no glass structure such as a greenhouse or pit to place them in, they will do very well placed in some light window facing the east or south; in this condition they will bloom during the winter and spring. If then wanted for out-of-door planting, they should be planted in the open ground after it has been prepared as directed, any time during the first week in May in such latitudes as New York, earlier if farther south, and later if farther north. When Roses are received from the florist at the planting season they should be shaded from the sun for a few days after planting, as being boxed when sent by mail or express, they require this protection from the bright sunlight until they get partly established in the ground.

**GARDEN CULTURE OF THE ROSE.—Continued.**

**CLASSIFICATION.** Roses are described in our catalogues under the heads **Hardy Hybrid Perpetuals, Hardy Climbing Roses, Hybrid Teas** and **Tea or Monthly Roses**, so that the buyer will be able to distinguish to what class they belong and have them treated accordingly, or order from such classes as are best suited to the district in which they are to be planted. The Teas are all of the tender Monthly class and would not be hardy in any district where the temperature falls lower than 25 degrees below the freezing point. Such Roses, when grown in the Northern States, can be lifted in October or November and placed in pots or boxes, and if given plenty of light, such as being placed in a light sitting-room or in a greenhouse, will bloom throughout the winter. In cases where they are not wanted for winter blooming, we would advise their being lifted up in November, placed in boxes and kept in a cold cellar, giving them one watering when they are placed in the boxes, but no more until they are taken from the cellar and planted in the open ground the next season in May, as already directed.

**DORMANT ROSES.** These are usually budded or grafted on brier stocks and sold without any soil on the roots, also before they start to grow. They are exclusively of the Hybrid Perpetual class. They should be planted very early in the spring, usually they are not to be obtained after April 15th. Care should be taken in planting to set them in the ground so that the point where the bud or graft was inserted in the stock is three inches below the surface of the soil. There are likely to be growths from the stock and these should be cut off below the surface as they appear, otherwise the strength will be absorbed by them and the true Rose which was budded or grafted will languish and die.

**WINTER PROTECTION.** The Monthly Roses are only half-hardy, and are therefore liable to be winter-killed where the thermometer falls 25 degrees below the freezing point, so that protection is necessary. The best way to do this is to bend the branches down and fasten them securely within two or three inches of the ground, by tying them to stakes driven in for that purpose, or if close enough they may be tied to each other. Then spread dry leaves or rough litter over them to a depth of say six inches. This should not be done, however, until severe cold weather sets in, so that nearly all the leaves are off the plants, and they are thoroughly ripened, which is usually about December 1st, in this latitude. This covering should not be taken off until all danger of severe frost is over, say about April 1st, in this section.

**SUCCESS** depends in a great measure on the care given to the plants after planting. The soil should be stirred frequently with a fork-hoe or hand-cultivator, so as to keep it mellow, as well as to keep down weeds. This is particularly necessary during dry weather, as ground which is frequently cultivated will be found to retain moisture far better than if it is allowed to become baked into a hard crust, in addition to this it induces a development of young roots close to the surface. Care must be taken, however, not to hoe too deeply so as to injure the young roots. Another important point is to cut off all the flowers which are past their prime, as not only are they unsightly, but they tend to weaken the plant by forming seedpods; by removing them the strength which would otherwise be wasted goes to form new growth, thus increasing the number of blooms.

**INSECTS, ETC., MOST TROUBLESOME to ROSES.**

**GREEN FLY (Aphis).** Colonies of these congregate on the young growth and suck the juices of the plant. Spray with some tobacco solution or dust the plant with tobacco powder, after first wetting them so the powder will adhere.

**ROSE SLUG.** A light green worm that eats the leaves. Apply whale-oil soap, 1 pound dissolved in 8 gallons of water; or Paris green, 1 ounce to 10 gallons of water.

**ROSE BUG.** A brownish hardshell beetle that eats the leaves and blossoms. A difficult insect to combat. Hand-pick or knock off on a sheet in early morning. The larva (grub) of the Rose Bug is destructive to the roots of roses which it infests.

**MILDEW.** This grayish-white film on the affected foliage can be held in check by dusting the plants with flowers of sulphur or syringing with Bordeaux Mixture, 1 pint in 6 to 8 gallons of water.

# Pruning Flowering Shrubs and Vines.

The object of pruning is, firstly to keep the subject within certain bounds and promote the best development of flowering wood; secondly to cut out old and "blind" wood which only weaken the plant and invite insects and diseases.

As a guide to know when best to prune shrubs, will state that there are two great classes to consider:

**CLASS A** are summer or autumn flowering shrubs, the flower buds being formed on new wood the same year they blossom. Such shrubs are to be pruned when dormant in fall or winter.

**CLASS B** are spring-flowering shrubs, the buds on which were formed the year before. Consequently to prune these, excepting just after they have finished blooming, removes the flower buds so there would be no flowers in the spring.

We append a list of some of the standard shrubs prefixed with a letter "A" or "B" to indicate to which of the classes they belong as described above.

- |   |   |
|---|---|
| B— <b>Akebia.</b> (Prune sparingly.)                            | B— <b>Jasminum.</b>                                   |
| A— <b>Althea.</b> (Rose of Sharon.)                             | B— <b>Kudzu Vine.</b>                                 |
| B— <b>Aristolochia.</b>   | B— <b>Lilac.</b>                                      |
| B— <b>Azaleas, Hardy Ghent, Mollis.</b>                         | A— <b>Lycium.</b>                                     |
| (Cut out old wood only.)  | B— <b>Philadelphus.</b> (Mock Orange.)                |
| B— <b>Berberis.</b> (Cut out old wood only.)                    | B— <b>Prunus.</b>                                     |
| B— <b>Bignonia.</b>   | B— <b>Rhododendrons.</b> (Cut out old and dead wood.) |
| B— <b>Calycanthus Floridus.</b> (Strawberry Shrub.)             | B— <b>Rhodotypus.</b>                                 |
| B— <b>Celastrus.</b>  | B— <b>Ribes.</b> (Flowering Currant.)                 |
| B— <b>Cercis.</b> (Judas Tree.)                                 | A— <b>ROSES, Bush Varieties.</b>                      |
| B— <b>Chionanthus.</b> (White Fringe.)                          | (See Page 29.)  |
| A— <b>Clematis Jackmanii.</b>                                   | B— <b>ROSES, Climbing Varieties.</b>                  |
| A— <b>Clethra.</b>  | A— <b>Robinia.</b> (Rose Acacia.)                     |
| A— <b>Corchorus.</b>  | B— <b>Sambucus.</b> (Elder.)                          |
| B— <b>Cornus.</b> (Dogwood.)                                    | A— <b>Spiræa Anthony Waterer.</b>                     |
| B— <b>Cydonia.</b> (Japan Quince.)                              | A— <b>Spiræa Bumalda.</b>                             |
| B— <b>Deutzia.</b>  | A— <b>Spiræa Callosa.</b>                             |
| B— <b>Exochorda.</b>  | A— <b>Spiræa Douglasi.</b>                            |
| B— <b>Forsythia.</b>  | B— <b>Spiræa Thunbergii.</b>                          |
| A— <b>Honeysuckle.</b>  | B— <b>Spiræa Prunifolia.</b>                          |
| A— <b>Hydrangea.</b> (Paniculata Grandiflora, and Arborescens.) | B— <b>Spiræa Van Houtteii.</b>                        |
| B— <b>Hydrangea Herbaceous Varieties, Hortensis, etc.</b>       | B— <b>Viburnum.</b> (Snowball.)                       |
|   | B— <b>Weigelia.</b>                                   |
|   | B— <b>Wistaria.</b>                                   |

## The QUANTITY of BULBS or PLANTS REQUIRED for FILLING BEDS.

Our table is based on round beds, the outer row being planted one-half the distance from the edge that the bulbs or plants stand apart. For a square bed, add 25% to the number required for a round bed of the same diameter. For an oval bed, length and width is to be added and then divided by 2, thus: 8 and 6 feet = 14 feet divided by 2 gives 7 feet. Such a bed requiring the same number of bulbs or plants as a round bed 7 feet in diameter.

**Bulbs or Plants Required at Stated Distances Apart.**

DIAMETER OF ROUND BED	PLANTED 4 IN. APART	PLANTED ½ FT. APART	PLANTED 1 FT. APART	PLANTED 1 ½ FT. APART	PLANTED 2 ft. APART
3 feet	65	30	8		
4 "	125	50	13	7	
5 "	175	83	21	10	
6 "	265	118	30	15	8
7 "	350	158	40	20	10
8 "	460	206	52	25	13
10 "	720	325	82	40	20
12 "	1020	456	115	57	30
14 "	1400	615	155	78	40
16 "	1820	810	202	100	50
18 "	2290	1020	255	126	64
20 "	2840	1260	315	156	78



# Popular or Common Names of Flowering Plants and Shrubs

Common Name.	Botanical Name.
Aaron's Beard . . . . .	<i>Saxifraga sarmentosa</i>
Abyssinian Banana, <i>Musa Ensete</i>	
Adam's Needle . . . . .	<i>Yucca filamentosa</i>
African Daisy . . . . .	<i>Arctotis</i>
Alkanet . . . . .	<i>Anchusa</i>
Allegheny Vine . . . . .	<i>Adlumia</i>
Alum Root . . . . .	<i>Heuchera</i>
American Ivy . . . . .	<i>Ampelopsis quinquefolia</i>
American Senna . . . . .	<i>Cassia</i>
Amethyst . . . . .	<i>Brouallia</i>
Angelica Tree . . . . .	<i>Dimorphanthus</i>
Annual Poinsettia, <i>Euhporbia heterophylla</i>	
Apple Gourd . . . . .	<i>Cucurbita maliformis</i>
Asparagus Fern . . . . .	<i>Asparagus plumosus</i>
Asphodel . . . . .	<i>Asphodelus luteus</i>
Avens . . . . .	<i>Geum</i>
Auricula . . . . .	<i>Primula auricula</i>
Baby's Breath . . . . .	<i>Gypsophila paniculata</i>
Baby Primrose . . . . .	<i>Primula Forbesi</i>
Bachelor's Buttons, <i>Centaurea cyanus</i> and sometimes <i>Globe Amaranth</i>	
Balloon Vine . . . . .	<i>Cardiospermum</i>
Balm of Gilead . . . . .	<i>Cedronella cana</i>
Balsam Apple . . . . .	<i>Momordica balsamina</i>
Balsam Pear . . . . .	<i>Momordica charantia</i>
Barbados Spice Lily, <i>Amaryllis equestris</i>	
Barberry . . . . .	<i>Berberis</i>
Basket Flower . . . . .	<i>Centaurea Americana</i>
Bay Tree . . . . .	<i>Laurus nobilis</i>
Beard-tongue . . . . .	<i>Pentstemon</i>
Bear's Breech . . . . .	<i>Acanthus latifolius</i>
Bee Balm . . . . .	<i>Monarda rosea</i>
Bee Larkspur . . . . .	<i>Delphinium elatum</i>
Bellflower . . . . .	<i>Campanula</i>
Belvidere . . . . .	<i>Kochia trichophylla</i>
Bergamot . . . . .	<i>Monarda</i>
Bethlehem Sage . . . . .	<i>Pulmonaria</i>
Bible Leaf . . . . .	<i>Tenacetum Balsamita</i>
Bird's Eye . . . . .	<i>Adonis</i>
Bitter Sweet Vine, <i>Celastrus scandens</i>	
Blackberry Lily . . . . .	<i>Pardanthus Chinensis</i>
Black-eyed Susan, <i>Thunbergia alata</i>	
Bladder Nut . . . . .	<i>Staphylea Colchica</i>
Bladder Senna . . . . .	<i>Colutea arborescens</i>
Blanket Flower . . . . .	<i>Gaillardia</i>
Blazing Star . . . . .	<i>Liatris</i>
Bleeding Heart . . . . .	<i>Dielytra</i>
Blue Bells . . . . .	<i>Mertensia</i>
Blue Bells of Scot- land . . . . .	<i>Campanula rotundifolia</i>
Blue-bottle . . . . .	<i>Centaurea cyanus</i>
Blue Bonnet . . . . .	<i>Scabiosa Caucasica</i>
Blue Sage . . . . .	<i>Salvia patens</i>
Bluets . . . . .	<i>Centaurea cyanus</i> — <i>Hous- tonia</i>
Blue-eyed Grass . . . . .	<i>Sisyrinchium</i>
Boston Fern . . . . .	<i>Neprolepis Bostoniensis</i>
Boston Ivy . . . . .	<i>Ampelopsis Veitchii</i>
Bottle Brush . . . . .	<i>Metrosideros</i>
Bottle Gourd . . . . .	<i>Lagenaria pyrotheca</i>
Bouncing Bet . . . . .	<i>Saponaria</i>
Boxwood . . . . .	<i>Buxus sempervirens</i>
Brazilian Morning Glory, <i>Ipomæa Setosa</i>	
Bridal Wreath . . . . .	<i>Spiræa prunifolia</i>
Burning Bush . . . . .	<i>Euonymus Europæus</i>
Bush Eschscholtzia, <i>Hunnemannia fumarica- folia</i>	
Buttercup . . . . .	<i>Ranunculus repens</i>
Butterfly Flower . . . . .	<i>Schizanthus</i>
Button Bush . . . . .	<i>Cephalanthus</i>
Calabash Pipe Gourd . . . . .	<i>Lagenaria vulgaris sypho</i>
Calico Bush . . . . .	<i>Kalmia latifolia</i>
California Poppy, <i>Eschscholtzia</i>	
California Tree Poppy, <i>Romneya Coulteri</i>	
Calla . . . . .	<i>Richardia</i>

Common Name.	Botanical Name.
Campion . . . . .	<i>Lychnis</i>
Canary Bird Vine, <i>Tropæolum Canariense</i>	
Candytuft . . . . .	<i>Iberis</i>
Canterbury Bells, <i>Campanula media</i>	
Canterbury Bells Cup and Saucer, <i>Campanula media caly- canthema</i>	
Cape Fuchsia . . . . .	<i>Phygellus</i>
Cape Hyacinth . . . . .	<i>Hyacinthus candicans</i>
Cape Jessamine . . . . .	<i>Gardenia florida</i>
Cape Marigold . . . . .	<i>Calendula pluvialis</i>
Cardinal Climber, <i>Ipomæa Quamoclit hybrida</i>	
Cardinal Flower . . . . .	<i>Lobelia cardinalis</i>
Carnation . . . . .	<i>Dianthus caryophyllus</i>
Castor Oil Bean . . . . .	<i>Ricinus</i>
Catalonian Jessa- mine . . . . .	<i>Jasminum grandiflorum</i>
Catchfly . . . . .	<i>Silene</i>
Chamomile . . . . .	<i>Anthemis</i>
Charity . . . . .	<i>Polemonium</i>
Cherry Pie . . . . .	<i>Heliotrope</i>
Chimney Bellflower, <i>Campanula pyramidalis</i>	
China Pink . . . . .	<i>Dianthus Chinensis</i>
Chinese Bellflower, <i>Platycodon</i>	
Chinese Lantern Plant, <i>Physalis Francheti</i>	
Christmas Rose . . . . .	<i>Helleborus</i>
Cigar Plant . . . . .	<i>Cuphea platycentra</i>
Cinnamon Vine . . . . .	<i>Dioscorea batatas</i>
Cinquefoil . . . . .	<i>Potentilla</i>
Climbing Fumitory, <i>Adlumia</i>	
Climbing Hydrangea, <i>Schizophragma</i>	
Climbing Lily . . . . .	<i>Gloriosa</i>
Cloud Grass . . . . .	<i>Agrostis nebulosa</i>
Clove Pinks . . . . .	<i>Dianthus plumarius fl. pl.</i>
Cockscomb . . . . .	<i>Celosia cristata</i>
Columbine . . . . .	<i>Aquilegia</i>
Coneflower . . . . .	<i>Rudbeckia</i>
Coral Plant . . . . .	<i>Erythrina cristi-galli</i>
Cornelian Cherry, <i>Cornus mascula</i>	
Cornflower . . . . .	<i>Centaurea cyanus</i>
Cornflower Aster, <i>Stokesia cyanea</i>	
Coventry Bells . . . . .	<i>Campanula trachelium</i>
Cowslip . . . . .	<i>Primula veris</i>
Crape Myrtle . . . . .	<i>Lagerstræmia</i>
Creeping Jennie, <i>Lysimachia nummularia</i>	
Cup Flower . . . . .	<i>Nierembergia</i>
Cup and Saucer Vine, <i>Cobæa scandens</i>	
Cypress Vine . . . . .	<i>Ipomæa Quamoclit</i>
Dame's Rocket . . . . .	<i>Hesperis matronalis</i>
Dame's Violet . . . . .	<i>Hesperis matronalis</i>
Dawn Flower . . . . .	<i>Ipomæa Learii</i>
Day Lily . . . . .	<i>Hemerocallis</i>
Devil-in-the-Bush, <i>Nigella</i>	
Devil's Walkingstick, <i>Aralia spinosa</i>	
Dipper Gourd . . . . .	<i>Lagenaria vulgaris</i>
Dish Rag Gourd . . . . .	<i>Luffa acutangula</i>
Dogwood . . . . .	<i>Cornus florida</i>
Double White Feverfew, <i>Matricaria alba plena</i>	
Dusty Miller . . . . .	<i>Centaurea and Cineraria (White Leaved)</i>
Dutchman's Pipe Vine, <i>Aristolochia siphon</i>	
Egg Gourd . . . . .	<i>Cucurbita ovifera</i>
Egyptian Lotus . . . . .	<i>Nelumbium</i>
Egyptian Paper Plant, <i>Cyperus papyrus</i>	
Elephant's Ear . . . . .	<i>Caladium esculentum</i>
Emerald Feather . . . . .	<i>Asparagus Sprengeri</i>
English Daisy . . . . .	<i>Bellis</i>
English Primrose, <i>Primula vulgaris</i>	
Evening Glory . . . . .	<i>Ipomæa Bona Nox</i>
Evening Primrose, <i>Oenothera</i>	
Evening Scented Stock, <i>Matthiola bicornis</i>	
Evergreen Thorn, <i>Cratægus</i>	
Everlasting . . . . .	<i>Acroclinium, Rhodanthe, Helichrysum, Xeran- themum</i>
Everlasting Pea . . . . .	<i>Lathyrus latifolius</i>

## POPULAR or COMMON NAMES of FLOWERS, PLANTS and SHRUBS—Continued.

Common Name.	Botanical Name.	Common Name.	Botanical Name.
Fair Maids of France,	<i>Ranunculus aconitifolius</i>	Jacobean Lily...	<i>Amaryllis formosissima</i>
Fairy Lily.....	<i>Zephyranthes</i>	Jacob's Ladder...	<i>Polemonium</i>
False Chamomile,	<i>Boltonia</i>	Japan Pinks.....	<i>Dianthus Heddewigii</i>
False Dragonhead,	<i>Physotegia</i>	Japan Primrose...	<i>Primula Japonica</i>
False Indigo.....	<i>Baptisia</i>	Japan Quince....	<i>Pyrus Japonica</i>
False Solomon's Seal,	<i>Smilacina</i>	Japanese Hop....	<i>Humulus Japonicus</i>
Feather Grass....	<i>Stipa pennata</i>	Japanese Ivy....	<i>Ampelopsis Veitchii</i>
Feathered Cockscomb,	<i>Celosia plumosa</i>	Jasmine.....	<i>Jasminum</i>
Feverfew.....	<i>Matricaria</i>	Jerusalem Cherry,	<i>Solanum capsicastrum</i>
Fiery Thorn.....	<i>Crataegus</i>	Jerusalem Cross..	<i>Lychnis Chalcedonica</i>
Fish-bone Thistle,	<i>Chamaepeuce</i>	Job's Tears.....	<i>Coix lachrymæ</i>
Fish-Geranium....	<i>Zonale Geranium</i>	Joseph's Coat....	<i>Amaranthus tricolor</i>
Flame Flower....	<i>Tritoma</i>	Judas Tree.....	<i>Cercis Canadensis</i>
Flamingo Flower,	<i>Anthurium</i>	Kanas Gay Feather,	<i>Liatris</i>
Flea-bane.....	<i>Erigeron</i>	Kenilworth Ivy...	<i>Linaria cymbalaria</i>
Fleur-de-Lis.....	<i>Iris Germanica</i>	Kudzu Vine.....	<i>Pucrarria thunbergiana</i>
Flora's Paint Brush,	<i>Cacalia</i>	Lady Washington Geranium.....	<i>Pelargonium hybridum</i>
Floss Flower.....	<i>Ageratum</i>	Lady's Eardrops...	<i>Fuchsia</i>
Flower of Jove... Agrostemma Flos Jovis		Lady's Slipper....	<i>Balsam</i>
Flowering Almond,	<i>Pyrus Japonica</i>	Larkspur.....	<i>Delphinium</i>
Flowering Flag....	<i>Iris Germanica</i>	Lavender.....	<i>Lavendula vera</i>
Flowering Maple..	<i>Abutilon</i>	Leadwort.....	<i>Plumbago</i>
Flowering Sage....	<i>Salvia splendens</i>	Lemon Verbena...	<i>Aloysia citriodora</i>
Flowering Spurge..	<i>Euphorbia corollata</i>	Leopard Plant....	<i>Farfugium</i>
Foam Flower.....	<i>Tiarella</i>	Leopard's Bane... Doronicum	
Forget-me-not....	<i>Myosotis</i>	Lilac.....	<i>Syringa vulgaris</i>
Fountain Grass... Pennisetum Japonicum		Lily of the Nile... Richardia Ethiopica	
Fountain Plant... Amaranthus salicifolius		Lily of the Valley, Convallaria majalis	
Four-O'Clocks....	<i>Mirabilis Jalapa</i>	Liver Leaf.....	<i>Hepatica</i>
Foxglove.....	<i>Digitalis</i>	London Pride....	<i>Saxifraga umbrosa</i>
Fringe Flower....	<i>Schizanthus</i>	London Tufts....	<i>Sweet William</i>
Fringed Pinks....	<i>Dianthus laciniatis</i>	Loose Strife.....	<i>Lythrum</i>
Garden Heliotrope,	<i>Valerian</i>	Love Grove.....	<i>Nemophila</i>
Gardener's Garters,	<i>Phalaris arundinacea var.</i>	Love-in-a-Mist... Nigella	
Garland Flower... Daphne cneorum		Love-in-a-Puff... Balloon Vine	
Gas Plant.....	<i>Dictamnus</i>	Love-lies-Bleeding, Amaranthus caudatus	
Gay Feather.....	<i>Liatris</i>	Lupine.....	<i>Lupinus</i>
German Ivy.....	<i>Senecio scandens</i>	Madagascar Periwinckle, Vinca rosea	
Giant Daisy.....	<i>Pyrethrum uliginosum</i>	Madeira Vine....	<i>Boussingaultia</i>
Gilliflower.....	<i>Stocks</i>	Madwort.....	<i>Alyssum</i>
Ginkgo Tree....	<i>Salisburia adiantifolia</i>	Maiden Hair Fern, Adiantum	
Globe Amaranth... Gomphrena globosa		Maiden Hair Tree, Salisburia adiantifolia	
Globe Flower....	<i>Trollius</i>	Mallow.....	<i>Hibiscus</i>
Globe Thistle....	<i>Echinops</i>	Maltese Cross....	<i>Lychnis</i>
Goat's Beard....	<i>Spiræa Aruncus</i>	Marguerite.....	<i>Chrysanthemum frutescens</i>
Gold Cups.....	<i>Eschscholtzia</i>	Marsh Mallow... Hibiscus Moscheutos	
Gold Tuft.....	<i>Alyssum saxatile</i>	Marsh Marigold... Caltha	
Golden Bell.....	<i>Forsythia</i>	Marvel of Peru... Mirabilis Jalapa	
Golden Chain... Cytisus laburnum		Matilija Poppy... Romneya Coulteri	
Golden Currant... Ribes aureum		Matrimony Vine... Lyctum Chinense	
Golden Elder....	<i>Sambucus nigra aurea</i>	Meadow Beauty... Rheiza Virginica	
Golden Feather... Pyrethrum aureum		Meadow Rue.... Thalictrum	
Golden Moss.....	<i>Sedum acre</i>	Meadow Sage....	<i>Salvia</i>
Golden Rod.....	<i>Solidago Canadensis</i>	Meadow Sweet... Spiræa Ulmaria	
Goldilocks.....	<i>Chrysocoma</i>	Mexican Fire Plant, Euphorbia heterophylla	
Gooseberry Gourd, Cucumis Grossularia		Mexican Poppy... Argemone	
Grass Pinks....	<i>Dianthus plumarius</i>	Michaelmas Daisies, Asters perennial	
Ground Ivy.....	<i>Glechoma</i>	Mignonette.....	<i>Reseda odorata</i>
Groundsell.....	<i>Glechoma or Nepeta</i>	Mignonette Vine... Boussingaultia	
Guelder Rose... Viburnum opulus sterilis		Milfoil.....	<i>Achillea</i>
Hardy Sweet Pea, Lathyrus latifolius		Mint.....	<i>Mentha</i>
Hare Bell.....	<i>Campanula carpatica</i>	Moccasin Flower... Cypripedium spectabile	
Hawthorn.....	<i>Crataegus ozyantha</i>	Mock Orange... Cucurbita aurantiaca	
Heart's Ease....	<i>Pansies</i>	Mock Orange... Philadelphus coronarius	
Heath.....	<i>Erica</i>	Moneywort.....	<i>Lysimachia nummularia</i>
Heather.....	<i>Calluna</i>	Monkey Flower... Mimulus tigrinus	
Hedge Hog Gourd, Cucumis crinaceus		Monkshood....	<i>Aconitum</i>
Helmet Flower... Aconitum		Moonflower....	<i>Ipomæa grandiflora</i>
Hercules Club Gourd, Lagenaria clavata		Moonpenny Daisy, Chrysanthemum latifolium	
Honesty.....	<i>Lunaria biennis</i>	Moonwort.....	<i>Lunaria biennis</i>
Horn of Plenty... Datura		Morning Glory... Convolvulus major	
Horse Shoe Geranium, Zonale Geranium		Mosquito Plant... Vincetoxicum	
Hyacinth Bean... Dolichos lab-lab.		Moss Pink.....	<i>Phlox subulata</i>
Ice Plant.....	<i>Mesembryanthemum crystallinum</i>	Moss Verbena... Verbena erinoides	
Indian Currant... Symphoricarpus vulgaris		Mother of Thousands, Linaria cymbalaria	
Indian Shot.....	<i>Canna</i>	Mountain Feather Fleece, Stenanthium	
Iron Weed.....	<i>Vernonia</i>	Mountain Fringe, Adlumia	
		Mountain Laurel, Kalmia latifolia	
		Mountain Pink... Phlox subulata	

POPULAR or COMMON NAMES of FLOWERS, PLANTS and SHRUBS—Continued.

Common Name.	Botanical Name.
Mourning Bride . . . . .	<i>Scabiosa</i>
Musk Plant . . . . .	<i>Mimulus moschatus</i>
Myrtle (Trailing) . . . . .	<i>Vinca minor</i>
Nancy-Pretty . . . . .	<i>Saxifraga umbrosa</i>
Nasturtium . . . . .	<i>Tropaeolum</i>
Night Blooming Jessamine, <i>Cestrum Parqui</i>	
None-so-pretty . . . . .	<i>Saxifraga umbrosa</i>
Norfolk Island Pine, <i>Araucaria</i>	
Old Maid . . . . .	<i>Vinca rosea</i>
Old Man . . . . .	<i>Artemisia abrotanum</i>
Old Woman . . . . .	<i>Artemisia stelleriana</i>
Oleaster . . . . .	<i>Elaeagnus</i>
Oswego Tea . . . . .	<i>Monarda didyma</i>
Ox-eye . . . . .	<i>Adonis vernalis</i>
Painted Daisy . . . . .	<i>Chrysanthemum tricolor</i>
Painted Leaf . . . . .	<i>Euphorbia heterophylla</i>
Painted Tongue . . . . .	<i>Salpiglossis</i>
Pampas Grass . . . . .	<i>Gynerium argenteum</i>
Paris Daisy . . . . .	<i>Chrysanthemum frutescens</i>
Parlor Ivy . . . . .	<i>Senecio scandens</i>
Pasque Flower . . . . .	<i>Anemone pulsatilla</i>
Passion Flower . . . . .	<i>Passiflora</i>
Peach Bells . . . . .	<i>Campanula persicifolia</i>
Pear-Shaped Gourd, <i>Cucurbita piriformis</i>	
Pearl Bush . . . . .	<i>Ezochorda grandiflora</i>
Periwinkle . . . . .	<i>Vinca</i>
Peruvian Daffodil, <i>Ismene calathina</i>	
Pheasant's Eye Pink, <i>Dianthus plumarius</i>	
Pincushion Flower, <i>Scabiosa</i>	
Pitcher Plant . . . . .	<i>Nepenthes</i>
Plantain Lily . . . . .	<i>Funkia</i>
Plume Poppy . . . . .	<i>Bocconia</i>
Polyanthus . . . . .	<i>Primula elatior</i>
Pomegranate . . . . .	<i>Punica</i>
Poppy Mallow . . . . .	<i>Callirhoe involucreta</i>
Pot Marigold . . . . .	<i>Calendula</i>
Prickly Poppy . . . . .	<i>Argemone</i>
Primrose . . . . .	<i>Primula</i>
Prince's Feather . . . . .	<i>Amaranthus cruentus</i>
Princess Pinks . . . . .	<i>Dianthus punctatus</i>
Purple Fringe Tree, <i>Rhus cotinus</i>	
Quaking Grass . . . . .	<i>Briza maxima</i>
Ragged Robin . . . . .	<i>Lychnis flos-cuculi</i>
Ragged Sailor . . . . .	<i>Centaurea cyanus</i>
Red Bud . . . . .	<i>Cercis Canadensis</i>
Red Hot Poker . . . . .	<i>Tritoma uvaria</i>
Rock Cress . . . . .	<i>Arabis</i>
Rock Rose . . . . .	<i>Helianthemum</i>
Rose Campion . . . . .	<i>Lychnis chalcedonica</i>
Rose of Heaven . . . . .	<i>Agrostemma</i>
Rose of Sharon . . . . .	<i>Althea</i>
Rosemary . . . . .	<i>Rosmarinus</i>
Rosin Plant . . . . .	<i>Silphium</i>
Rubber Plant . . . . .	<i>Ficus elastica</i>
Satin Flower . . . . .	<i>Lunaria biennis</i>
Satin Lily . . . . .	<i>Sisyrinchium</i>
Scarborough Lily . . . . .	<i>Vallota purpurea</i>
Scarlet Flax . . . . .	<i>Linum coccineum</i>
Scarlet Runners . . . . .	<i>Phaseolus multiflorus</i>
Scarlet Sage . . . . .	<i>Salvia splendens</i>
Scotch Pinks . . . . .	<i>Dianthus plumarius</i>
Screw Pine . . . . .	<i>Pandanus utilis</i>
Sea Bugloss . . . . .	<i>Anchusa</i>
Sea Holly . . . . .	<i>Eryngium</i>
Sea Lavender . . . . .	<i>Statice</i>
Sea Pink . . . . .	<i>Armeria maritima</i>
Sensitive Plant . . . . .	<i>Mimosa pudica</i>
Serpent Gourd . . . . .	<i>Trichosanthes colubrina</i>
Shasta Daisy . . . . .	<i>Chrysanthemum latifolium</i> <i>hybridum</i>
Shell Flower . . . . .	<i>Tigridia</i>
Shooting Star . . . . .	<i>Dodecatheon</i>
Silk Oak . . . . .	<i>Grevillea robusta</i>
Silver Bell . . . . .	<i>Halesia tetraptera</i>
Silver Vine . . . . .	<i>Actinidia arguta</i>
Smilax . . . . .	<i>Myrsiphyllum</i>
Smoke Tree . . . . .	<i>Rhus cotinus</i>
Snake Cucumber . . . . .	<i>Cucumis flexuosus</i>
Snaptail . . . . .	<i>Antirrhinum</i>

Common Name.	Botanical Name.
Sneezewort . . . . .	<i>Helenium</i>
Snowball . . . . .	<i>Viburnum</i>
Snowberry . . . . .	<i>Symphoricarpos</i>
Snowdrop Tree . . . . .	<i>Halesia tetraptera</i>
Snow in Summer . . . . .	<i>Cerastium tomentosum</i>
Snow on the Mountain, <i>Euphorbia variegata</i>	
Soapwort . . . . .	<i>Saponaria</i>
Solomon's Seal . . . . .	<i>Polygonatum</i>
Speedwell . . . . .	<i>Veronica</i>
Spider Plant . . . . .	<i>Cleome pungens</i>
Spiderwort . . . . .	<i>Tradescantia</i>
Spindle Tree . . . . .	<i>Euonymus</i>
Spring Beauty . . . . .	<i>Claytonia Virginica</i>
St. Bruno's Lily . . . . .	<i>Anthericum liliastrum</i>
Star Jessamine . . . . .	<i>Jasminum grandiflorum</i>
Star of Bethlehem, <i>Ornithogalum umbellatum</i>	
Starwort . . . . .	<i>Asters perennial</i>
Stocks . . . . .	<i>Gilliflower</i>
Stone-crop . . . . .	<i>Sedum</i>
Strawberry Shrub, <i>Calycanthus floridus</i>	
Straw Flower . . . . .	<i>Helichrysum</i>
Summer Cypress . . . . .	<i>Kochia tricophylla</i>
Summer Fir . . . . .	<i>Artemisia saccorum</i> <i>viridis</i>
Sunflower . . . . .	<i>Helianthus</i>
Sun Plant . . . . .	<i>Portulaca</i>
Sun Rose . . . . .	<i>Helianthemum</i>
Swan River Daisy, <i>Brachycome</i>	
Swan River Ever-lasting, <i>Rhodanthe</i>	
Sweet Alyssum . . . . .	<i>Alyssum maritimum</i>
Sweet Olive . . . . .	<i>Oleo fragrans</i>
Sweet Peas . . . . .	<i>Lathyrus odoratus</i>
Sweet Pepper Bush, <i>Clethra alnifolia</i>	
Sweet Rocket . . . . .	<i>Hesperus matronalis</i>
Sweet Scabious . . . . .	<i>Scabiosa</i>
Sweet Shrub . . . . .	<i>Calycanthus floridus</i>
Sweet Sultan . . . . .	<i>Centaurea moschata</i>
Sweet William . . . . .	<i>Dianthus barbatus</i>
Sweet Woodruff . . . . .	<i>Asperula odorata</i>
Tamarisk . . . . .	<i>Tamarix</i>
Tassel Flower . . . . .	<i>Calcalia</i>
Thoroughwort . . . . .	<i>Eupatorium</i>
Thrift . . . . .	<i>Armeria</i>
Tiger Flower . . . . .	<i>Tigridia</i>
Toad Flax . . . . .	<i>Linaria</i>
Torch Lily . . . . .	<i>Tritoma</i>
Trailing Myrtle . . . . .	<i>Vinca minor</i>
Tree Celandine . . . . .	<i>Bocconia</i>
Trumpet Flower . . . . .	<i>Datura</i>
Trumpet Vine . . . . .	<i>Bignonia</i>
Turban Gourd . . . . .	<i>Cucurbita pepo-turbinata</i>
Umbrella Plant . . . . .	<i>Cyperus alternifolius</i>
Umbrella Tree . . . . .	<i>Magnolia tripetala</i>
Valerian . . . . .	<i>Valeriana</i>
Verbain . . . . .	<i>Verbena</i>
Virginia Creeper . . . . .	<i>Ampelopsis quinquefolia</i>
Virgin's Bower . . . . .	<i>Clematis flammula</i>
Wake Robin . . . . .	<i>Trillium</i>
Waldmeister . . . . .	<i>Asperula odorata</i>
Wallflower . . . . .	<i>Cherianthus</i>
Waxed Gourd . . . . .	<i>Cucurbita verucosa</i>
Wart Plant . . . . .	<i>Mesembryanthemum</i> <i>tricolor</i>
Wax-work . . . . .	<i>Celastrus scandens</i>
Wayfaring Tree . . . . .	<i>Virburnum lantana</i>
Weeping Lantana, <i>Lantana delicatissima</i>	
White Fringe . . . . .	<i>Chionanthus Virginica</i>
Wild Cucumber Vine, <i>Echinocystis lobata</i>	
Windflower . . . . .	<i>Anemone</i>
Wolf's-bane . . . . .	<i>Aconitum</i>
Woodbine . . . . .	<i>Lonicera sempervirens</i>
Wood Lily . . . . .	<i>Trillium</i>
Woodruff . . . . .	<i>Asperula odorata</i>
Yarrow . . . . .	<i>Achillea</i>
Yellow Sultan . . . . .	<i>Centaurea suaveolens</i>
Youth and Old Age, <i>Zinnia</i>	
Zanzibar Balsam . . . . .	<i>Impatiens sultana</i>
Zebra Grass . . . . .	<i>Eulalia zebrina</i>
Zephyr Flower . . . . .	<i>Zephyranthes</i>

# Strawberries and Other Small Fruits.

## BRIEF DIRECTIONS for their CULTURE in GARDENS

**STRAWBERRIES: When to Plant.** Ordinary "ground layers" carried over winter in coldframes are procurable in spring and may then be set out, the earlier the better. Pot-grown plants may be grown or purchased during late summer and autumn. If set out not later than September they will bear a good crop the succeeding season. Strawberries require richly manured, well-tilled soil; the plants should be set 15 inches apart, in rows 2 feet apart; 100 plants will plant 4 rows, 30 feet long; an acre requires 14,520 plants if set at the above distance, but for horse cultivation they should be set 2 feet apart, in rows 3 feet apart, requiring 7,260 plants for an acre. Firm the plants well in the soil, keep thoroughly cultivated and cut off all runners. In the middle of December cover the beds to a depth of 3 inches with salt meadow hay, straw or leaves. In April as soon as the plants show an indication of growth, push the covering away from the plants to allow them to come up through. This "mulching" protects the plants from the cold in winter and the heat in summer, keeps the fruit clean, and prevents the growth of weeds.

**PERFECT versus IMPERFECT Flowering Strawberries.** The blossoms of strawberries are either staminate (perfect flowering) or are destitute of stamens and are termed pistillate (imperfect flowering). Pistillate varieties must have a row of some perfect flowered sort flowering at the same time planted every nine or twelve feet apart among them, or better yet, every third or fourth plant in the row, to pollinize their blossoms. When properly pollinized the pistillate varieties are usually the most prolific.

**HARDY GRAPES** may be planted any time while they are dormant and the ground is free from frost, which in this section is generally from the first of November to December, and the first of April to May. The soil best suited for the growing of the hardy Grapes is what is known as a light, rich loam. If the drainage is not perfect naturally, it must be supplied by draining artificially. In preparing the ground for Grape vines, a hole should be dug at least two feet deep and wide, and the bottom filled in with rubble so as to secure drainage. The soil should be well enriched with manure, and in planting, the roots should be spread in a lateral direction and at least four inches under the surface. After planting, the ground must be thoroughly firmed with the feet around the plant and a good watering given.

For family use, the best method of training and pruning is what is known as the "spur" system. On receiving the vines from the nursery, they may consist of one or more shoots, but on planting them they should be cut back to two or three eyes or buds and, when they start to grow, all the buds should be rubbed off except one, selecting the strongest and, as far as possible, the one nearest to the ground. Train this shoot perpendicularly to a stake, and in the fall, when the leaves drop, cut back to about a foot from the ground. When the vine starts the following year, rub off all eyes or buds except two, of the strongest and nearest to the ground; these will form two canes, and should reach a height of ten or twelve feet: in the fall, when the leaves drop, these should be cut back to about four feet, and laid down on the ground; when cold weather sets in, cover them with four or five inches of leaves or litter. In the spring, before the buds swell, the canes should be trained horizontally, one to the right, the other to the left. As the vines should be planted eight feet apart, this will make the arms of the proper length, and upright growths will spring from the canes thus laid down; not more than eight should be allowed to grow, and they should be selected so as to be about a foot apart. The height of these upright growths may be regulated according to the height of the arbor, fence or building where they are planted, anywhere from three to fifteen feet will answer. Vines thus treated may be allowed to produce a few bunches the third year, and by the sixth year may be fruited to the height of ten or twelve feet, if the vines are trained that high; if they are grown lower, they ought to mature every bunch set. As the fruit is always borne on the lateral branches, not more than two bunches should be allowed to remain on each branch and, unless the vine is very strong, not more than one bunch should be allowed.

**HARDY GRAPES.—Continued.**

Summer pruning is of the highest importance. Where the main shoots are growing beyond bounds, they should be pinched back, as this conserves the strength of the vine and also develops laterals; these laterals should be pinched in turn when they become crowded, and in many cases had better be cut back to the second eye. It is also a good practice after the fruit is set, and while it is the size of a small pea, to cut off all the vine beyond the bunch; again, if at any time during the season there appears to be a superabundance of foliage, it is a good practice to pinch some of it off, so as to allow a free access of light and air to the bunches.

The regular pruning may be done at any time from November to March, and while it is almost impossible to tell precisely how each particular vine should be pruned, yet it is safe to say that if all the very light wood is cut away, and the side shoots, to the thickness of a lead pencil or over, are cut back to the eye above where it started from in the spring, the work will be well done.

**CURRENTS** do well in any good garden soil, but it is important that they be in an exposed situation where they have the full benefit of sunlight and air. The Red or White Currants should be planted three feet apart each way. The Black Currant is a stronger growing and should be planted five feet apart.

One of the most important points in the cultivation of Currants is pruning. In the fall, as soon as the leaves have fallen, at least one-third of the young growth of the previous summer should be cut away and all the old shoots in the center of the bush should be cut out, the object being to allow free access of air and light into the center of the bush. If desired, Currants can be trained against a stone wall, or fence, and if grown in that way, they may be allowed to reach a height of eight or ten feet, taking the same care to prevent overcrowding of the branches. Grown in this way, the fruit is generally larger than when grown in the bush form.

**GOOSEBERRY.** The instructions given for the cultivation of the Currant will answer also for the Gooseberry, though a rather heavy, well-drained soil is preferred for the Gooseberry, and a liberal amount of cow manure should be incorporated with the soil. We would also recommend that upon the approach of hot weather a heavy mulch of cow manure, leaves or litter be put around the plants; the object of this is to keep the earth cool and moist, and to develop roots near the surface; if there are surface roots in good working condition, little fear may be entertained of mildew.

**RASPBERRIES** are partial to a light, rich, well-drained soil and will do very well where there is a little shade. They should be planted in rows four feet apart and two feet between the plants in the rows, or they may be planted in separate hills three feet apart each way. Either fall or spring will do for planting, but if planted in fall a covering should be put on the first winter. The canes of the Raspberry are biennial—that is, the cane or shoot that is formed one season bears fruit the next season and dies off after fruiting; for this reason all the canes that have fruited should be cut away close to the ground when the crop is gathered and new shoots allowed to develop. No more than five or six should be allowed to each plant; all the others should be cut away. When the shoots that are allowed to grow reach a height of four feet, the tips should be taken out with the thumb and finger, thus stopping the upward growth, and the result will be a development of the side branches, which in turn should be stopped like the main shoot when they have reached about a foot and a half in length. Treated in this way, the plants will become stocky and self-supporting, and will produce a larger and finer crop of fruit than if allowed to grow in a scrambling manner.

In very exposed situations in northern latitudes, the canes are not always of ironclad hardiness, and therefore some winter protection is necessary; in any case a covering of four or five inches of dry leaves or litter should be spread over the roots, to do away with any possibility of injury by frost. In localities where it is essential to cover the canes, it is better to bend them down and cover them with pine branches, or with a few inches of earth thrown over them with a spade.

**BLACKBERRY.** The cultivation of the Blackberry is nearly similar to that of the Raspberry, except that it should be planted about one-third farther apart and, being hardier, there is no need for covering it in winter in this latitude.

The **DEWBERRY** is of trailing habit and will do very well at the foot of old walls, or in any out-of-the-way place; it responds readily, however, to good culture. It should be planted in rows six feet apart, with the plants three feet apart in the rows, and should be treated the same as Strawberries. Do not let the ground get completely covered with the vines, but keep them trained along the row, allowing a free space between each row for cultivation and for a pathway to pick the fruit.

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# Lawns and Grass Plots

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## MAKING AND MAINTAINING

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A lawn may be formed either by laying turf or by sowing seed. The gain in time by "sodding" is so slight as to be scarcely worthy of consideration, while the results obtained by both methods are not to be compared. Sods, no matter how carefully cut and closely laid, often separate in dry weather, leaving crevices about which the grass dies out; besides, the grasses that compose such sod as is procurable for "sodding" lawns are usually coarse and not at all the best sorts for forming a perfect lawn, having a smooth turf of closely interwoven fine-leaved grasses that maintain their rich green color throughout the season. The perfect lawn is only obtained by sowing a blend of several varieties suited to conditions and climates. Only study, experiment and experience teach which are the best grasses for different localities and soils. Therefore it is advisable to purchase from a reliable seedsman such of the several lawn grass mixtures as they offer suited to your requirements. In addition to the selection of a proper blend of grass seeds, the next most important factor in producing a perfect and permanent lawn is:

**SOIL AND PREPARATION.** Good, deep, rich loam, overlaying a gravel or other porous subsoil, insures underdrainage, permitting rain and surface water to percolate down and through the top soil, keeping it evenly moist, neither saturated nor dried out, the surplus water being stored or drained off below. Having such soil and subsoil conditions it will only be necessary to apply evenly well-rotted stable manure at the rate of 15 to 25 tons per acre, and coarse-ground bone at the rate of  $\frac{1}{2}$  to 1 ton per acre, then turn the top soil, manure, etc., with plow or spade to a depth of not less than 8 inches. The grass roots will then go down deep where they are less susceptible to damage from heat, drouth and freezing.

Where the under- or subsoil is clay, underdrainage must be resorted to as described on page 5. The next best thing to drainage is subsoil plowing or for small areas "trenching." We elucidate both operations on page 5. The whole scheme in laying a perfect and permanent lawn is to make conditions so inviting below that the grass roots will go down deep, for grass that roots only in the upper three or four inches of surface soil burns out in hot, dry weather and freezes and heaves out in winter weather.

**GRADING** is shaping the surface contour of the land to ideals. This means filling in low spots with soil from high spots, and doing this often lays bare on the "uppers" inorganic earth or "subsoil" in which nothing can grow, excepting, perhaps, the most aggressive of plants—weeds. In other words inorganic earth (subsoil) until leavened by weathering and incorporated with humus—decayed vegetable and animal matter—is a repellent medium in which to grow grass or any cultivated plants. For this reason it is usually necessary before grading to remove the top soil both from the places to be filled in, and the hillocks to be leveled. Then when the grading has been done the top soil is to be respread.

How often we see a foundation or cellar excavated for some building, the inorganic subsoil being spread over top soil with disastrous results. In such cases the top soil should first have been removed and then replaced after the cellar soil had been spread.

**SEEDING.** After the ground has been graded to the desired shape, drained if necessary, and the top soil plowed and harrowed or spaded and raked as previously described; then seeding will be in order.

**QUANTITY OF SEED.** Five bushels of lawn grass seed is required to sow one acre, or one quart for 300 square feet (an area 15 x 20 feet). This may seem a liberal quantity, but it should be borne in mind that the fine-leaved lawn grasses do not tiller out to the same extent as the coarser pasture grasses, and besides, we want to get a lawn quickly and crowd out the weeds, the seeds of which are in all soils.

**LAWNS AND GRASS PLOTS.****Making and Maintaining.—Continued.**

**WHEN TO SOW AND HOW.** In the latitude of New York the seed may be sown at any time between April and October, preferably in early spring or early fall to get the benefit of the rains. A quiet day should be chosen so the seed can be sown evenly. It is best to make two sowings, the second at right angle to the first; this insures more even distribution. After sowing the seed it should be harrowed or raked in and then the ground should be rolled.

**SOWING BANKS AND TERRACES.** The difficulty to be overcome in getting grass established on slopes is to prevent its being washed out by heavy rains before thoroughly rooted. A continuous run of boards set on edge and held in place by stakes at the crest of the hill will assist in checking and turning the water. A special blend of deep-rooting grasses is required for such situations and we recommend our "Terrace Sod" lawn grass seed for the purpose.

**SHADY LAWNS.** When a lawn or portions thereof are much shaded, these shaded portions should be sown with "Shady Nook" Lawn Grass Mixture, which is a combination of grasses which in their wild state are to be found growing in the woods or other sheltered or shady spots. In the immediate neighborhood of large trees fertilizer should be applied liberally and frequently, for the trees absorb the plant food and impoverish the ground. Ground much shaded is frequently sour, and if the drainage is defective it is apt to be covered with moss. In such cases an application of lime raked into the soil is an excellent corrector and sweetener, but the moss should be first removed by means of a sharp rake.

**MAINTENANCE OF THE LAWN.** Grass must be fed just as the crops are. Constant mowing and removal of the clippings removes just that much digested plant food, which, if not replaced at least once a year, results eventually in an exhausted turf. Rotted stable manure is often spread thinly over the lawn in November and allowed to remain until spring. The goodness of this leaches out and into the ground and is very beneficial, but a lawn top-dressed with manure is unsightly and at times rather odoriferous, so it is becoming more and more the custom to feed the grass with commercial fertilizers. For slow but lasting enrichment, there is nothing better than raw bone meal evenly strewn over the surface at the rate of  $\frac{1}{2}$  to 1 ton per acre or 10 pounds for 300 square feet. For quick and luxuriant growth of grass the Henderson Lawn Enricher is best—apply in spring, summer or fall in same way and same quantity as advised for the ground bone—or half quantities of both may be applied according to the needs of the lawn. After the fertilizer has been sown it is well to scarify the surface of the lawn with a sharp steel rake.

**RENOVATING.** To renovate lawns that have become worn out where it is not convenient or desirable to renew by plowing up, they may be greatly benefited by running a light harrow over, if the surface is large, or by a sharp steel rake for smaller areas. After stirring the surface, so as not to hurt too severely the roots, lawn grass should be sown over the surface, harrowing or raking in about half the quantity advised for new lawns. After sowing, the surface should be rolled or beaten down. If spurious grass or weeds have got possession of the lawn, then it had better be plowed under and sown afresh, as previously directed.

**MOWING** should be begun in spring as soon as the grass is two or three inches high, and continued every seven or eight days until the cessation of growth in fall. If the lawn is gone over with the mower once a week, the clippings are best left on, as the sun quickly shrivels them up, so that they never appear unsightly; but if mowing is delayed two or three weeks, then the grass must be raked off.

**ROLLING.** The benefit derived from using a roller on the lawn, especially in the spring, is not fully understood. The action of freezing and thawing causes the ground to heave, and if it is not firmly pressed back with a roller before hot weather, the grass is apt to be killed or injured, leaving the lawn full of bare spots. For use on the lawn always take a "two or three section" roller, as it can be turned without injuring the grass. A 300-lb. roller is about as heavy as one man can pull, though a 400-lb. will be better if you have two persons to operate it.

## LAWNS AND GRASS PLOTS.

## Making and Maintaining.—Continued.

**WEEDS.** It sometimes happens that soil contains seeds of weeds; most of which are fortunately of annual duration and if the lawn is mown regularly, the weeds can not seed and will therefore not be troublesome the succeeding season. But where perennial weeds infest a lawn, such as dandelion, dock, plantain, thistle, etc., there is no other remedy than the slow process of cutting them out with the knife or spud.

Crab or summer grass is one of the commonest and most troublesome weeds that infest a lawn. It is however only an annual and, where it can be kept from seeding by mowing the flower and seed heads off, it will not be in evidence another season. Unfortunately crab grass has a sneaking habit of ducking below the cut of a lawn mower, so to be sure the seed heads are shorn off they should be elevated by raking before mowing.

**WEEDS IN WALKS, DRIVEWAYS, ETC.** The easiest and best way to get rid of weeds, moss, grass, etc., in garden walks, etc., is to apply Henderson's Weed Destroyer, a fluid compound. It completely destroys all vegetable growth wherever applied, and by its effect on the ground prevents fresh growth for a year afterwards, thus saving an immense amount of labor in hoeing, etc. For brick walks it is a boon. Its application is easy, being in a liquid form and only requiring to be mixed with water and applied with a watering can or sprinkling cart. A gallon diluted with 16 to 20 gallons of water is sufficient to treat 400 square feet. If the ground is very dry it should first be sprinkled with clear water, so the Weed Destroyer will not soak away too quickly. Where large weeds and docks are to be destroyed it is best to mow or chop off the tops first.

**WORMS ON LAWNS.** Fish, angle or earth worms sometimes colonize in rich moist soil in such numbers as to disfigure the surface with their worm casts. The best way to get rid of the worms is to apply Carter's Worm Killer—an English non-poisonous powder which also benefits the grass. It is procurable from us and the price is very reasonable. It should be strewn evenly over the affected locality at the rate of half a pound per square yard and then the ground should be thoroughly watered. This will cause the worms to immediately come to the surface and die, when they may be swept up and removed.

**MOLES, HOW TO EXTERMINATE THEM.** Moles often cause havoc in lawn and garden by burrowing here and there, destroying roots, raising ridges and causing plants and grass to die out.

On the lawn a good heavy roller frequently used over the "runs" often frightens the moles and drives them to other quarters. But the best thing to do is to exterminate them, which may be done with a good mole trap—procurable from seedsmen—but to be successful in trapping moles one must understand something of this wary little animal's habits. The mole usually has a permanent home situated in some protected place, as under the root of a tree or a large stone, and from this base they burrow in different directions. Some of these "runs" are used regularly and others are seldom used and sometimes a "run" is used but once. Of course to catch moles it is necessary to set traps over the "runs" that are used the most. To determine this depress the ridges in places with the foot, then examine the depressions the succeeding day and note those that have been again raised. Here set your traps—precautions being taken against the smell of one's hands remaining about the traps.

Moles and other animals or insects inhabiting underground burrows may also be exterminated with carbon bisulphide, usually procurable at drug stores. It is an inflammable fluid that evaporates when exposed to the air, killing all animal life that breathes the fumes which are not injurious to vegetation. A tablespoonful (nearly 1 oz.) of the bisulphide poured in the track or "run" through a hole made with a pointed spade handle or dibber, the hole being quickly closed with soil or by a pressure of the foot, will penetrate and fumigate several feet of the "run" or a wad of cotton waste the size of hen's egg, rags, dried grass, corn cobs or other absorbent material may be saturated with bisulphide and thrust into openings at intervals. For mice, ground squirrels, etc., the mouths of the burrows should be closed over with a wad of the saturated material to prevent escape of the pests. A pint (about 1 lb.) of the carbon bisulphide is usually sufficient to treat a dozen to twenty ordinary burrows.



## SOME

# Insecticide and Fungicide Remedies

### FOR PLANTS, TREES, ETC.

**Insects that Eat Foliage, Fruits, Flowers, etc.**, whether they are bugs, worms, caterpillars or slugs, etc., are best destroyed by some poisonous Insecticide, such as Arsenate of Lead, Paris Green or Hellebore. If for any reason it is not deemed safe to use a poison, the next best non-poisonous Insecticides are Persian Powder, Slug Shot, Fir Tree Oil Soap, Kerosene Emulsion, Tobacco Extract or Tobacco Dust.

**Insects that Suck the Juices of Plants**, such as lice, green and black fly, red spider, scale, mealy bug, etc., can only be destroyed by skin-irritating Insecticides, such as Kerosene Emulsion, Tobacco Extract, Tobacco Dust, or Fir Tree Oil Soap.

**Plants and Fruits Affected by Fungous Disease**, such as mildew, spot, dry rot, rust, etc., should be promptly treated with either Bordeaux Mixture, Ammoniated Copper Solution or Flowers of Sulphur.

**For Tree Insects on Trunks**, eggs on bark, and to prevent crawling up the trunk, use Borowax, Whale-Oil Soap or Tree Tanglefoot.

**For Borers** in trunks of trees, eject—in the mouths of the burrows—from a spring bottom oil can a small quantity of carbon bisulphide, and promptly close the hole with clay or putty. The bisulphide—procurable at most drug stores—is an inflammable liquid that evaporates when exposed, the fumes penetrating the burrows and killing the borers without injuring the tree. Afterwards apply Borowax.

**Never apply Insecticides or Fungicides when Fruits are in Bloom; it kills the Bees and affects Pollination.**

**APPLICATION OF INSECTICIDES AND FUNGICIDES** is best done for fluid solution with a Spray Pump, Knapsack Sprayer, Syringe or Vaporizing Bellows. In powder form they are best applied with a Powder Gun, Bellows or Duster.

**ARSENATE OF LEAD.** A poison rapidly taking the place of Paris Green. Its great advantages are that it adheres well to the foliage and spraying does not have to be repeated as it does not readily wash off by rain. It also remains well suspended in solution so that an even distribution can be obtained. It is white in color and shows just where it has been applied. It does not injure tender foliage.

A L. For young and tender vegetation 1 lb. to a 40-gallon barrel of water will usually be strong enough; for hard-wooded plants the strength can be increased up to 2 or 3 lbs. Apply as a spray.

**BEECHCREOT.** A wood preserving tree paint. It kills fungus and is shunned by borers and other insects. It prevents decay in the portions of trees injured by storm-torn limbs and applied after pruning it prevents bleeding. One gallon applied with a brush covers about 300 square feet.

**BORDEAUX MIXTURE.** A fungicide, curing and preventing black rot, mildew, blight, rust, scab and all fungoid diseases of fruits and plants.

B M. Dissolve 1 gallon to 50 gallons of water, and apply in a spray.

B P. A combined fungicide and insecticide, best made by adding 1 lb. of Paris Green to 150 gallons Bordeaux as above.

**BOROWAX.** A complete protection against tree borers if applied in accordance with instructions, armorplates the tree at the point where the moth deposits its eggs and thus renders it immune to further infestation for several years. Quantity required:  $\frac{1}{2}$  pint to a pint to a tree according to size.

**CARTER'S WORM-KILLER.** For angle or fish worms in lawns, putting greens, etc. It is a non-poisonous powder to be strewn evenly over the affected surface at the rate of half a pound per square yard and then the ground must be thoroughly saturated with water so the powder will soak in; this will cause the worms to immediately come to the surface and die, when they may be swept up and removed.

**CLUBICIDE.** An insecticide, germicide and disinfecting fluid particularly valuable in addition to its other uses—as a soil sterilizer. It destroys all soil insects, ants, worms, slugs, maggots and fungus diseases and in consequence plants attain maximum root development and produce larger and better crops. It is a certain preventive of club root, maggots and root lice that infest Carrots, Onions, Cabbage, Asters, etc. Water the plants thoroughly with it once a week in proportion of 1 gallon of Clubicide to 1000 gallons of water gradually increasing the strength to one gallon of Clubicide to 500 gallons of water as the plants approach maturity.

**COPPER SOLUTION, AMMONIATED.** A fungicide, the essential ingredient, "Carbonate of Copper," being dissolved in ammonia in this, while in Bordeaux it is counteracted by lime. Bordeaux is the cheaper for all ordinary purposes, but for late sprays, when fruits are nearing maturity, or plants in bloom, Copper Solution is usually used, as there is no limy sediment left to be washed off.

C S. Dilute 1 quart to 25 gallons of water; apply in a spray.

**CUT WORM FOOD.** A sweetened poisoned compound alluring and palatable to cut worms, cabbage worms, etc., in consequence when sprinkled around such newly set plants as are usually "cut off" by these depredators, they feast on cut worm food and are destroyed. One pound is sufficient for about 100 plants.

**FIR TREE OIL SOAP.** It frees plants of nearly all insects to which they are subject, and for the following it has no superior: Mealy bug, scale, red spider, aphid (black and green), thrip, blight, worms and slugs.

F O. Dissolve 1 oz. to 1 gallon of soft or rain water (for tender plants or young growth make weaker). Spray on.

**HELLEBORE, Powdered.** For the destruction of slugs, worms, caterpillars, etc. Less poisonous than Paris Green, and safer to use when fruits and vegetables are nearly ripe. Can be used as a powder, or in water.

H D. DRY APPLICATION. Apply alone or mix 1 lb. with 4 lbs. of powdered lime or flour. Blow on with bellows or powder-gun.

H S. IN SOLUTION. Dissolve 1 oz. to 3 gallons of water; apply in a spray.

**KEROSENE EMULSION.** Ready for use by simply adding water. For cabbage worm, scale on trees, caterpillars, melon louse, rose bugs, green fly and lice of all kinds, all sucking insects, either on plants or animals.

K E. Mix 1 part Emulsion to 25 to 50 gallons water, according to strength required. Spray on.

**LIME SULPHUR SOLUTION.** A liquid compound now extensively used for all scale insects on trees and shrubs and it is also of benefit for fungous diseases of the bark, etc., as can be treated in winter. It must be diluted and applied with a spray pump while the trees are dormant, after the leaves have fallen in fall and before the buds swell in spring.

L S S. It can be used quite strong—say 1 gallon to 11 gallons of water—during December, January and February, but earlier or later than these months it will be safer to dilute it 1 gallon to 30 to 40 of water.

**PARIS GREEN.** A poisonous, insoluble powder, for preventing the ravages of potato bugs, codling moths, worms, caterpillars, slugs and bugs.

P G. DRY APPLICATION. Mix with plaster, flour or other dilutant—1 part to 100; apply with duster, bellows or gun.

P S. IN SOLUTION. Mix 1 lb. to 150 to 300 gallons of water. Apply as a spray, pump, syringe or vaporizer.

P B. BAIT. For cut worms, mix 1 oz. with 8 oz. of syrup; mix thoroughly with fresh chopped grass, leaves or bran.

**PERSIAN POWDER, OR BUHACH.** A most effective, non-poisonous, impalpable powder, so fine that it penetrates the innermost crevices. For worms, flies, aphid and almost all kinds of insects it is very effectual, suffocating them by filling up the breathing pores.

P P. DRY. Blow on with a bellows or gun.

**SCALECIDE.** A splendid remedy for San Jose, Cottony Maple Scale and other scale insects affecting hard-wooded shrubs and trees. It is not poisonous being simply a mechanical preparation of petroleum-oil that instantly mixes with cold water and then is immediately ready to use. It is safe and easy to apply and will kill every scale that it reaches without injury to tree, shrub, fruit or flower buds if put on late in fall, winter, or spring while the foliage is off.

S. Use one gallon of Scalecide to 20 gallons of water. Spray on with force pump or vaporizing syringe.

**SLUG SHOT.** A non-poisonous powder and a popular insecticide: requires no further mixing or preparation, easily applied and not dangerous to the person applying it, of fruits and vegetables treated. Very effectual in destroying potato bugs and beetles, green and black flies, slugs, worms, caterpillars, etc.

S S. Apply with duster, bellows or gun. 10 to 40 lbs. is sufficient for an acre.

**SULPHUR FLOWERS.** A fine non-poisonous powder. Extensively used for mildew, by being blown on affected plants when moist.

S F. Apply with bellows or gun.

**TOBACCO EXTRACT.** (Nicoteen.) One of the most effectual insecticides for the destruction of all insects and scale on plants; a pure, concentrated (40%), extract of tobacco. Also a most effectual and safe remedy for fumigating greenhouses. Use a scant tablespoonful to 1½ pints of water for each pan which is sufficient when vaporized by placing a hot iron in it, for 600 square feet of floor space.

T E. FOR SPRAYING. Dilute with from 500 to 600 parts of water, according to the delicacy of the plants to be treated, and apply as a spray. For scale, 1 part to 400 parts water.

**TOBACCO DUST.** For green and black aphid, fleas, beetles, etc. Splendid fertilizer and preventive for insects in the ground and around roots.

T D. For insects on plants, apply with powder duster, bellows or gun.

T X. For worms or grubs in the soil, apply liberally to the surface and rake in, or strew thickly in the drills before planting.

**TREE TANGLEFOOT.** No crawling insect can pass a band of Tree Tanglefoot. Apply early in the spring—before the caterpillars commence to crawl—and again in the fall if troubled with the fall canker worm. One pound for a six-foot band 4 inches wide,  $\frac{1}{8}$  inch thick.

**WHALE-OIL (FISH-OIL) SOAP.** Makes an excellent wash for trees and plants where insects and eggs affect the bark, and for smearing on the trunks of trees to prevent worms from crawling up.

W O. For insects on plants, dissolve  $\frac{1}{4}$  lb. to a gallon of water; apply with syringe or spraying pump.

W S. For bark insects, etc., dilute with water to consistency of thick paint, and apply with brush.

## Some Insects and Diseases

Affecting GARDEN VEGETABLES, FRUITS, FLOWERS, etc.  
and what remedies may be used

We give below a list of vegetables, fruits and plants, and the insects or diseases that usually attack them, followed by one or more letters. To find out what remedy to use, refer to corresponding letters on pages 57 and 58. For instance: if an insect is attacking your Asparagus, by referring to the list below you will find that it is probably the beetle that is causing the devastation; the letters following Asparagus beetle are A L, P S and S S. By reference to the corresponding letters on pages 57 and 58 you will find that Paris Green or Arsenate of Lead in solution or Slug Shot blown on in powder form are the remedies to apply.

**Asparagus.** For beetle use A L, P S or S S.

**Aster.** For leaf rust, spray every two weeks with C S; for beetle use K E or cover with S S.

**Bean.** For rust and blight spray with B M when in third leaf and thereafter at intervals of ten to fourteen days.

**Beet.** For leaf spot and rust, and root rot, spray with B M in June and occasionally thereafter.

**Blackberry.** Treat as Raspberries.

**Cabbage.** For cabbage worms and slugs, when plants are small, spray with A L or P S; when partially headed spray H S or K E, or dust with H D or S S; for later applications use P P; for louse or aphid use K E, T E or P P.

**Carnation.** For leaf rust, blight and spot, use frequently B M, or if in flower C S.

**Carrot.** Use for worm or caterpillar A L, P S, S S or P P.

**Cauliflower.** Treat as Cabbage.

**Celery.** For blight, rust and scald use frequently B M; celery worm, use while young, H D or H S; when maturing use P P or S S.

**Chrysanthemum.** Leaf spot and mildew, use frequently B M or if in flower C S or F O; for lice use K E, T E or T D; see also page 41.

**Corn.** Cut worms, cut worm food.

**Cucumber.** See Melon and treat the same excepting that, Cucumber foliage being tender, the insecticides and fungicides should be diluted  $\frac{1}{2}$  more; for borer, see Squash.

**Currant.** For leaf rust, mildew, blight and spot use early and occasionally B M, or if fruit is ripening C S; for currant worm use when foliage first appears and occasionally A L or P S, excepting when in fruit, then use H D or H S; for leaf bug or hopper use K E or T E.

**Dahlia.** For leaf bug use K E; for green worm use H D, P P or T E.

**Egg Plant.** For leaf spot and rust use B M early and repeat at intervals of two weeks, when fruit is ripening use C S; for potato bug use A L, P G or P B, or treat both fungus and insects at one time by using B P.

**Endive or Chicoree.** For green worm P P or S S.

**Gooseberry.** Treat as Currants, which see; for fruit worm use W O.

**Grape.** For all fungous diseases, including mildew, fruit rot, etc., spray as soon as buds swell with B M, again when first leaves have expanded, again when flowers have fallen and at intervals of two weeks if necessary, substituting C S after fruit colors; for slug, flea, beetle, etc., use A L or P S, or treat both insects and fungus by using B P.

**INSECTS AND DISEASES AFFECTING PLANTS, AND REMEDIES.—Continued.**

**Greenhouse and Garden Plants.** For mildew use B M or C S or S F; for rust B M or C S for mealy bug, scale, red spider and mite use F O. K E or T E; for green and black fly or aphid use T E or P P; for leaf-eating slugs, worms and bugs use H S, K E or T E.

**Hollyhock.** For rust or disease spray as soon as leaves appear and at weekly intervals using B M. excepting when flower use C S; for hollyhock bug use K E.

**Lawns.** For earth worms, etc., see page 56.

**Lettuce.** For aphid or louse P P or S S or T D; for lettuce worm P P or S S.

**Lilies.** For foliage blight or disease spray when young and at weekly intervals with B M; or if in flower, with C S.

**Mangel Wurzel.** See Beets.

**Melon.** For mildew spray with B M when vines are young, again after blossoming and every two weeks; for leaf louse spray early and occasionally with K E; for worms A L. P G or P S; if gathering fruit use H D, H S or S S; for beetle apply H D, S S or T D.

**Mignonette.** For leaf blight or disease spray early and repeatedly with B M or C S.

**Onion.** For rust or mildew spray early and every two weeks with B M.

**Pansy.** For mildew and rust use C S; for insects P P.

**Parsley.** Worm or caterpillar, P P or S S.

**Palms.** See Greenhouse Plants.

**Parsnip.** Webworm, spray with A L or P G as soon as worms are seen, and again in July.

**Pea.** Mildew, use B M or S F.

**Potato.** For scab and rot see special directions below; for leaf blight, mildew, etc., spray with B M early and at intervals of two weeks or oftener; for potato bug use A L, P G or P S; both the fungus and bugs can be treated by using B P.

**POTATO SCAB.** This widespread disease affecting Potato tubers is due to the attack of a parasitic fungus, which causes the skin to become rough and scabby. This disease may be successfully combated by treating the planting stock with German Formalin or the American brand called Formaldehyde; 8 fluid ounces (1 pint) of this antiseptic is to be used in 15 gallons of water, which is sufficient to treat 20 to 25 bushels. The Potatoes should be freed from dirt by washing if necessary, then soaked for 1½ hours in the dilute solution, after which they are to be dried, cut and planted in the usual way; care being taken that the treated Potatoes do not again become infected by contact with contaminated sacks or other receptacles.

**Privet.** For webworm use early and often K E, P G or P S.

**Pumpkin.** See Squash.

**Radish.** For maggot use T X.

**Raspberry.** For rust spray B M before buds swell in spring and repeat every two weeks, substituting C S when fruit is coloring and ripe; for slugs use repeatedly A L, P S or H S, excepting when fruit is ready use P P or S S.

**Rose.** See Greenhouse and Garden Plants, also page 47.

**Ruta Baga.** See Turnip.

**Spinach.** For rust and mildew S F.

**Squash.** For borer keep vines well dusted with lime or S S; as vines run, cover every fourth joint with earth so they can take root from these points. For other insects and fungous diseases see Melon.

**Strawberry.** For leaf blight, rust, mildew, etc., spray as soon as growth starts with B M and repeat before blossoms are open; repeat again when through fruiting; for leaf roller, slug before or after fruiting, use A L, P G or P S during fruiting, and for bug use P P or S S.

**Sweet Peas.** For red spider and aphid use frequently K E; for root lice Clubicide.

**Sweet Potato.** For leaf spot and leaf mould spray with B M, which also checks tuber rot; for sawfly, larvae and bugs use P S or K E.

**TOMATO.** For blight and rot, spray early and at intervals with B M; for worm use A L, P S or H S, or if picking fruit use P P or S S.

**Trees and Shrubs, Ornamental and Shade.** Apply early in spring K E or W S, then for leaf-eating worms, caterpillars, slugs, bugs, etc. spray early and occasionally with A L, P S or K E; for scale use L S S, K E or S; for leaf spot, rust, mildew, etc., use B M; for borers, carbon bisulphide; to prevent fresh attacks of borers use Borowax or W S. See page 57.

**Turnip.** For fly, dust with S S; for maggots use T X.

**Verbena.** For mildew and rust spray with B M or C S diluted ¼ more; for red spider use T E.

**Violet.** For rust, spot or disease spray as soon as noticed with B M, and repeat every two weeks; if picking flowers substitute C S.

## To Protect Fruit, Vegetables, Etc., From Birds

Portions of mirror (looking-glass), or bright new tin, cut in 5 or 6 inch squares, suspended by a string from a hole made through one corner, will twist and sway with the breeze and throw the ever-changing reflected rays of sunlight about, thus frightening the birds and keeping them away. A strong cord or wire may be stretched across the garden and about 8 or 10 feet above it, from this the reflectors should be suspended not over 25 feet apart. Of course the above method is only partially effective on dull days. The sure way is to erect a light framework and cover it with either old fish net if procurable, or new "Bird Netting" may be purchased from us. This is good quality cotton netting 1-inch mesh and comes in 20-foot and 30-foot widths and of any reasonable length, and costs only about 75c. per 100 square feet.

## Slime on Ponds

The green scum (algæ) on sluggish waters may be kept in check by stocking the pond with fish; gold or silver carp, sunfish, minnows, tadpoles, etc., are best. If impracticable to do this, copper sulphate (blue stone) will eradicate the low vegetable life without injury to the higher plant, or animal life, if used so it makes a weak solution—about 1 part of the sulphate for 25,000,000 parts of the water. The crystal form in small cloth bags may be submerged at intervals and then be removed when the scum sinks or disappears.

## Does Your Soil Need Lime?

The application of lime to soil has long been recognized as beneficial, and recent investigations by Agricultural Experiment stations indicate that "liming the soil" every 4 to 6 years, is even more important than heretofore realized. Lime improves the soil's texture, disintegrates compact soils, facilitates drainage, renders inert plant foods available and corrects "sourness" or acidity. Damp lowlands were considered to be the most affected with sourness, but now it has been proven that soil acidity is very general even in upland soils. For light soils 500 lbs. of lime per acre may be sufficient, but for heavy soils or soils overly manured and rich in organic matter (humus) one ton per acre is the average dressing. To determine whether your soil is acid and needs liming procure some blue litmus paper at a drug store then insert one end of it—without touching it with the hands—in half a cupful of soil and water mixed to the consistency of thick porridge. In an hour or two remove and rinse. If the litmus paper is intensely reddened it shows that the soil is too acid and needs lime to neutralize it. If the paper only turns pinkish it indicates only slight acidity and lime may not be required.

A heavy dressing of lime is best plowed or dug in. A light dressing is best applied after plowing or digging to be harrowed or raked in.

## "Smudging" As a Protection Against Frost

"Smudging" is successfully practiced in some of the trucking districts of the South, and in fruit growing regions of the West as a protection against frost. The principles and methods are these:

During the day soil and plants absorb heat from the sun and become warmer, but at night the process is reversed and they give off (radiate) more heat than they receive and grow colder. With a clear sky radiation proceeds rapidly. Clouds form a blanket, check radiation and hold the warmth in the strata of air between the clouds and the earth. "Smudging" is producing clouds of dense smoke over the threatened area, which has the same effect of checking radiation and holding the earth's warmth beneath, thus preventing frost. "Smudge" fires are lighted on the windward side so the smoke is carried over the plants or trees to be protected. If the weather is likely to be very severe, the heat from a fire—here and there throughout the field—will be deflected back by the smoke clouds, spread, equalized and materially increases the warmth of the air below. "Smudge" fires are made of pruned branches, brush, straw, hay, strawy manure, or any refuse material—kept dampened to increase the cloud of smoke and vapor. Portable "Smudge" pots that burn "Smudge" oil—a low-priced by-product of the Standard Oil Company—are now extensively used in fruit growing districts. With about 40 of these to the acre, the temperature can be raised from 5° to 10° according to the wind.

## Some of Our Garden Friends That Should Not Be Destroyed

Bees—Useful pollenizers and almost indispensable to a continuance of a large percentage of plant life.

Dragon Flies—Feed on a great variety of injurious insects.

Tree Crickets—Feed on plant lice.

Ground Beetles—In both larval and adult stages feed on such insects as go underground to pupate.

"Lady Bug" Beetles—Feed on plant lice and scale insects, both in larval and adult stages.

Wasps—Generally beneficial because predatory upon other insects which they use as food for their larvae.

Lace-Wing Flies—Known as "Aphis Lions" in the larval stage when they feed on plant lice and many soft bodied leaf eating grubs.

Hornets—Feed almost entirely on insects.

Frogs and Toads—Feed largely on insects and slugs.

Lizards—Live on small beetles and other insects.

Garden Spiders—Feed on large flies, small moths, etc.

# The Essential Fertilizing Ingredients

## Nitrogen, Phosphoric Acid and Potash

Consumed by good average Crops of Vegetables and Fruits on one acre—as a guide to what the land requires.

A Good Crop on One Acre	Yielding		Would Consume		
	BUSHEL AND TONS	TOTAL WEIGHT	NITROGEN	PHOS- PHORIC ACID	POTASH
		lbs.	lbs.	lbs.	lbs.
Garden Vegetables Average of 20 kinds		24,357	99.8	46.2	94.9
Apple, fruit	600 bu.	28,800	36.4	8.6	54.7
Asparagus, sprouts		12,500	40.	11.2	15.
Beans, Garden, string	25 bu.	1,500	58.5	14.5	18.1
“ “ straw		2,800	.....	10.9	35.8
Beets, roots	400 bu.	24,000	57.6	21.6	105.6
“ leaves	4 tons	8,000	24.	8.	36.
Blackberries, fruit	2,500 qts.	2,500	3.7	2.2	5.
Cabbage		50,000	150.	55.	215.
Cauliflower		30,000	120.	48.	108.
Carrots, roots	500 bu.	25,000	55.	27.5	75.
“ tops		6,000	30.6	6.	17.4
Celery		30,000	72.	66.	228.
Cherries, fruit	350 bu.	14,000	.....	8.4	28.
Corn, Sweet, green ears	75 bu.	5,250	17.8	3.1	12.
“ “ stover	5 tons	10,000	46.	11.	32.
Cucumber, fruit		24,000	38.4	28.8	57.6
Currants, Red, fruit	100 bu.	4,000	.....	3.6	7.6
Egg Plant, fruit		20,000	.....	.....	.....
Grape, fruit	3 tons	6,000	10.2	8.4	30.
Kohl Rabi	500 bu.	25,000	120.	67.5	107.5
Lettuce		15,000	33.	15.	58.5
Melon, Musk, fruit	5 tons	10,000	.....	.....	.....
“ Water, fruit	8 tons	16,000	.....	.....	.....
Onion, bulbs	500 bu.	28,000	75.6	36.4	70.
Orange, fruit		112,000	212.	89.6	537.
Parsnip, roots	650 bu.	30,000	162.	57.	186.
“ tops		10,000	29.	8.	25.
Peaches, fruit	900 bu.	30,000	.....	15.	75.
“ new tree growth		6,000	54.	13.2	30.
Peas, Garden, seeds	25 bu.	1,500	53.7	12.6	15.1
“ “ straw		3,600	37.4	12.6	35.6
Pears, fruit	600 bu.	28,800	17.2	14.4	51.8
Plums, fruit	500 bu.	20,000	36.	8.	48.
Potatoes, tubers	300 bu.	18,000	61.2	28.8	104.4
“ tops		6,000	29.4	9.6	25.8
“ Sweet, tubers	350 bu.	19,250	46.2	15.4	71.2
“ “ vines		10,000	42.	7.	73.
Pumpkins, fruit	8 tons	16,000	17.6	11.2	14.4
Raspberries, fruit	2,000 qts.	2,000	3.	9.6	7.
Radish	3 tons	6,000	11.4	27.	9.6
Ruta Baga, roots	800 bu.	40,000	76.	48.	196.
“ “ leaves and tops	4 tons	8,000	24.	7.2	22.4
Spinach	200 bbls.	12,000	58.8	19.2	32.4
Squash, fruit	8 tons	16,000	.....	.....	.....
Strawberry, fruit	5,000 qts.	5,000	7.5	5.	13.
Turnip, roots	600 bu.	33,000	59.4	33.	128.7
“ leaves		9,000	27.	8.1	25.2
Tomato, fruit	400 bu.	20,000	34.	8.	72.
“ plants		15,000	48.	10.5	75.

## The Home Canning of Vegetables for Winter Use

Through the courtesy of Mrs. Rorer and her publishers for the benefit of the good housewife

These recipes by the acknowledged American authority on Modern Domestic Science have been selected as up-to-date specimens of many other recipes given in Mrs. Rorer's books entitled "Canning and Preserving" (Price, 75c.), "Vegetable Cookery and Meat Substitutes" (Price, \$1.65), and "Mrs. Rorer's New Cook Book" (Price, \$2.20), which we offer for sale. Mrs. Rorer says in her preface:

"In this age of adulteration we know not what we eat, and as canning is so simple an operation, it is unfortunate that so many people use food put up at factories.

Before giving recipes for the canning of vegetables, I should like to impress upon my readers the importance of understanding surgical cleanliness. All vegetables are easily canned at home and kept, providing everything is **sterile**, which means **dead**. Foods that ferment have in them some form of either plant or animal life. The danger of spoiling is greater if sugar is used, or in vegetables containing sugar, as yeasts grow in saccharine solutions. One yeast plant in a can of corn will spoil the contents of the entire can. This is also true of peas and beets. Acid vegetables, as tomatoes, are easily kept, providing sugar is not added. Many housekeepers, ignorant of the chemical constituents of foods, add sugar to sour materials to sweeten them. It does not change the acid one particle. Sugar enters the stomach as sugar and the acid as acid. To neutralize or change the acid one must add an alkaline material. A teaspoonful of bicarbonate soda to a quart of tomatoes will sweeten them by neutralizing the acid.

To have perfect success in canning vegetables, one must follow accurately the directions given. The jars must have glass or metal tops without lining. A porcelain lining leaves a space between it and the upper lid, which cannot be easily cleaned. For convenience, have a wire rack, with a centre handle made to fit a good-sized wash-boiler.

All vegetables must be freshly gathered and carefully prepared. Not a single law or rule can be modified or overlooked.

**TO CAN ASPARAGUS.** Select perfectly fresh asparagus; wash it well; peel the butts and cut off the hard portion. Cover with boiling salted water, boil fifteen minutes and cool. Arrange the asparagus in wide-mouthed jars, butts down. Fill the jars with cold water, adjust the rubbers, and put the tops on loosely. Stand these in a boiler, the bottom of which is protected by a rack. Surround the jars partly with cold water, cover the boiler, and boil continuously one hour. Lift one jar at a time, screw down the lid, cover the boiler and boil for another hour. You cannot lift the lids from any of the jars and lay them on the table, and then put them back on the jar, and have the contents keep. The lids must be screwed down without taking them from the jar.

**TO CAN STRING BEANS.** String and wash the beans. They may be canned whole or cut. Cover with boiling water, add a teaspoonful of salt and boil rapidly twenty minutes. Drain and pack into the jars. Fill the jars with cold water, adjust the rubbers, put the tops on loosely, and proceed exactly the same as you would for asparagus, cooking it first one hour, and then thirty minutes after the lids are screwed down or fastened.

**TO CAN LIMA BEANS.** Fill the jars full of young uncooked beans, then fill them full of cold water, adjust the rubbers and lay on the tops. Place the jars in a wire protecting rack, and pour in sufficient cold water to half cover them. Put the boiler over the fire, cover it closely with the lid, and boil steadily for three hours. Take up the jars, see that they are filled to overflowing, and screw on the covers as tightly as possible. Stand aside, where the air will not strike them, to cool. When cold, again screw the covers, and keep in a dark, cool place.

**TO CAN BEETS.** Select young, tender beets. Put into boiling water and boil for twenty minutes; cool and slip off the skins. Pack the beets into jars. Fill the jars with cold water, adjust the rubbers, put the tops on loosely, and finish precisely the same as for asparagus, cooking the same length of time.

**TO CAN CORN.** Corn must be perfectly fresh from the field. Remove the husks, cut the tips from the grains, or score them down the centre, and press out the pulp. Pack this pulp at once into perfectly clean glass jars, filling the jars within one inch of the top; adjust the rubbers and lay on the tops. Stand the jars in a wire protecting rack boiler and surround them with cold water. Cover the boiler, and after the water begins to boil, boil for three hours. Lift one jar at a time and fasten the top; do not lift the lid. Then add sufficient boiling water to entirely cover the jars and boil for one hour. Let them cool in the boiler, taking it, of course, away from the fire.

## THE HOME CANNING OF VEGETABLES FOR WINTER USE—Continued.

**TO CAN MUSHROOMS.** Stem, wash and peel the mushrooms. Pack them in glass jars with glass tops; adjust the rubbers, put the lids on loosely, and stand the jars in a wash-boiler, the bottom of which has been protected with a rack. Surround them half way up with cold water. Cover the boiler; bring to boiling-point and boil continuously for one and a half hours. Lift three jars from the boiler; take the lids off and drop them in a kettle of boiling water. Fill two jars from a third. Lift the lids with a skimmer, touching them only on the edge; put them back on the jars and fasten. Stand the jars back in the boiler. When you have filled the last jar, cover the boiler, bring the water again to boiling-point and boil rapidly for twenty minutes. Lift the jars when they are cool, examining them to see that the tops are firmly fastened.

**TO CAN PEAS.** Select perfectly fresh green peas; shell and pack at once into clean jars. Fill the jars with cold water; adjust the rubbers, lay on the tops, and finish precisely the same as with corn, cooking the same length of time. The last boiling must be done with the jars covered with boiling water.

**TO CAN STEWED TOMATOES.** Scald solid and perfectly sound tomatoes and remove the skins. Cut the tomatoes into halves and press each half to remove the seeds. Cut the halves into quarters, and lay in a porcelain-lined kettle; bring to boiling-point, add salt and pepper to make them palatable, and boil thirty minutes. Have ready the jars, rubbers and lids. The rubbers should be in a dish of very hot water, the lids in a pan of boiling water, and the jars should be washed and scalded. Take an ordinary dinner or pie plate, put in the centre a piece of folded cheese-cloth or an ordinary napkin, and stand on it a jar. Take it to the fire; fill it to overflowing with tomatoes; stand the plate on the table or at the side of the stove; adjust the rubber and screw on the lid, taking it directly from the boiling water. Do not put the lid on the table, nor touch it on the inside. Stand the jars aside until cool. Wipe them and place in a clean dry closet.

## Home Dried Vegetables FOR WINTER USE

**TO DRY SWEET CORN.** Select perfectly fresh corn, score each row of kernels down through the centre. Press out the pulp with a dull knife; spread the pulp on wooden, granite or china plates and dry either in the hot sun or a moderate oven. When partly dry it may be transferred to boards. In this way a larger quantity may be put into a given space. When perfectly dry put into jars or tin boxes and keep in a dry, cool place.

**TO DRY OKRA.** The young pods constitute the edible portion of this plant, and are used principally for soups. Okra may be preserved for winter use by cutting the pods into rings, stringing them on cords and drying in the hot air; or they may be canned the same as other vegetables.

**TO DRY YOUNG GREEN PEAS.** Shell the peas; throw into a kettle of boiling water; boil rapidly two minutes; drain; spread in a thin layer in tin pans. Stand in a warm oven; shake frequently until thoroughly dry. Put these into bags or boxes that have been lined with waxed paper and keep in a dry place. Soak one hour before cooking.

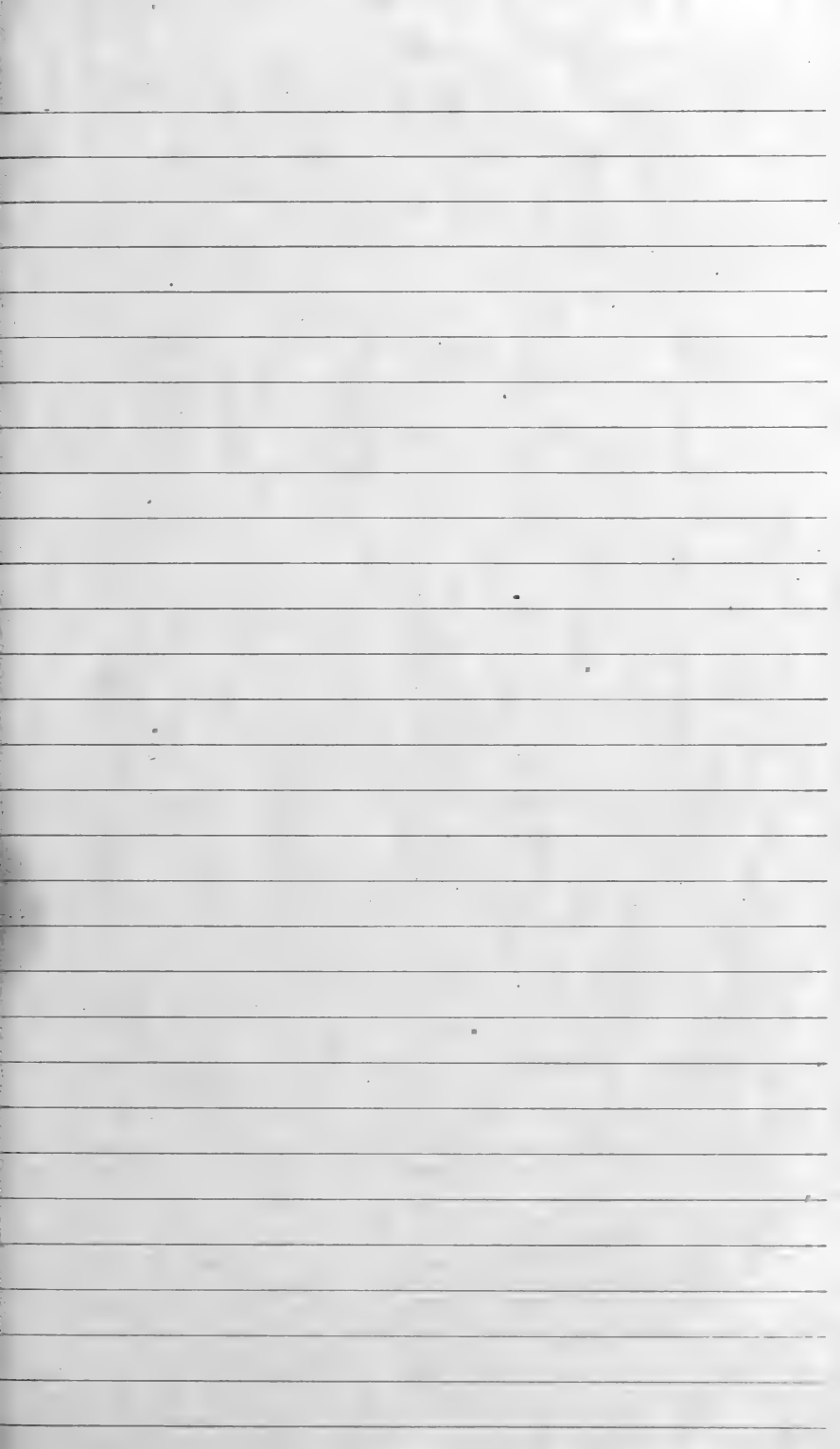
**TO DRY PARSLEY.** Pick the parsley when full grown, before flowering; wash thoroughly; shake dry, tie in loose bunches, hang in the air in the sun, or put on a board to dry in a moderately warm oven. When dry, rub the leaves to a powder, and put them through a fine sieve, bottle, cork and keep in a dry, cold closet.

**TO DRY PUMPKIN AND WINTER SQUASH.** Pare, cut into thin strips, then into pieces. Spread on boards and dry in the sun or warm oven. Keep in tin boxes or in glass jars in a dry closet.

To cook—soak over night in cold water.

**TO DRY HERBS.** During the summer, when herbs are in their highest state of perfection, full of juice, just before the flowering, they should be gathered for drying. Gather them just before flowering, on a very dry day, about ten or eleven o'clock, and make sure they are quite free from dew. Shake, remove each leaf carefully from the stems, and place them on soft brown paper on a board in the hot sun; or tie in bunches and hang in the air in the hot sun; or place them in a moderately hot oven. No matter which method is selected, the herbs must be dried quickly, to retain color and flavor. When dry, rub the leaves to a powder, sift, and put them at once into bottles. Cork and keep in a dry closet. Mark the jars plainly on the outside to avoid confusion.





DAY	DATE	THERM'R 8 a.m.	WEATHER	JULY 1913 GARDEN RECORD
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Su	27			
M	28			
Tu	29			
W	30			
Th	31			

DATE  
THERMOMETER  
3 A.M.

WEATHER

# AUGUST 1913 GARDEN RECORD

DATE	THERMOMETER 3 A.M.	WEATHER
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# SEPTEMBER 1913 GARDEN RECORD

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**OCTOBER 1913 GARDEN RECORD**

DAY	DATE	TEMPERATURE 8 a.m.	WEATHER
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DAY	DATE	TEMPER 8 a.m.	WEATHER	NOVEMBER 1913 GARDEN RECORD	
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DAY	DATE	TEMPERATURE 8 a.m.	WEATHER	DECEMBER 1913 GARDEN RECORD
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W	24			
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Tu	30			
W	31			





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